U.S. ARMY FIELD ARTILLERY CENTER AND FORT SILL

ANNUAL COMMAND HISTORY

(RCS CHIS-6 [R3])

1 JANUARY 1998 THROUGH 31 DECEMBER 1998

BY

COMMAND HISTORIAN'S OFFICE

JUNE 1999

Fort Sill, Oklahoma

Commander's Introduction

This Annual Command History captures the major events at Fort Sill during 1998. We are confident that our many important

initiatives will have an impact on the Field Artillery and Total Army for years.

In 1998, Fort Sill made great progress in doctrine, training, force design, equipment, and leader development. Key efforts included improving the Field Artillery Officer Basic Course, the Captain's Career Course, and the Warrant Officer Advanced Course. A few of the key issues that influenced overall installation operations were budget reductions and Fort Sill's continuing commitment to a community of excellence to ensure a high quality of life for the installation's soldiers, Marines, civilians, and family members and to a close association with the City of Lawton.

Fort Sill continues to serve as the Center for Fire Support for the United States Army and Marine Corps. The Field Artillery also continues in its proud tradition of excellence in the service to our nation and our allies through leadership and combat developments.

LEO J. BAXTER
Commanding

Major General, USA

PREFACE

The 1998 Annual Command History for the U.S. Army Field Artillery Center and Fort Sill follows the decision-making process as closely as possible. Through messages, staff reports, fact sheets, correspondence, briefings, and other documentation, the Command Historian's Office has recreated as closely as possible how the Center and Training Command made key decisions concerning training, leader development, doctrine, force design, equipment requirements, and mission support.

Because the Center and Training Command were involved in many diverse activities during the year, the Command Historian's Office under the direction of the Commanding General selected only those activities deemed to be the most historically significant to include in the History.

Preserving historical documents forms a vital part of the historian's work. After they are collected from the various Center and Training Command organizations during the process of researching, they are filed in the records and documents collection in the Command Historian's Office. All documents are available for use by Center and Training Command staff, other U.S. governmental agencies, and private individuals upon request.

Because new documents are often found after research and writing are completed, this contemporary history is subject to revision. As new documents are discovered, interpretations and conclusions will change. Comments and suggested changes should be directed to the Command Historian's Office.

In the process of researching and writing the History, the historian becomes indebted to many people for their advice and assistance. The Command Historian's Office would like to thank the people who provided their technical expertise. Without their help writing the history would have been far more difficult.

BOYD L. DASTRUP, Ph.D.
Command Historian
U.S. Army Field Artillery Center
and School

TABLE OF CONTENTS

CHAPTER ONE
MISSION, ORGANIZATION, AND MISSION SUPPORT
MISSION

Influenced by new field artillery technology introduced after the Spanish-American War of 1898, the development of indirect fire, and inadequately trained Field Artillerymen, the War Department opened the School of Fire for Field Artillery at Fort Sill, Oklahoma, in 1911. War Department General Orders No. 72, dated 3 June 1911, directed the school to furnish practical and theoretical field artillery training to lieutenants, captains, field grade officers, militia officers, and noncommissioned officers.[1]

[1]War Department, General Order No. 72, 3 Jun 1911, Doc I-1, 1997 U.S. Army Field Artillery Center and Fort Sill Annual Command History; Wilbur S. Nye Carbine and Lance: The Story of Old Fort Sill (Norman, OK: University of Oklahoma Press, reprinted 1974), pp. 320-29.

Composed of the U.S. Army Field Artillery School (USAFAS), the U.S. Army Field Artillery Training Center (USAFATC), and the Noncommissioned Officers Academy (NCOA), Fort Sill's Training Command continued the tradition established by the School of Fire at the beginning of the century. In 1998 Training Command used resident and nonresident courses to train Army and Marine Corps officers and enlisted personnel in the tactics, techniques, and procedures to employ fire support systems. Training Command also developed and refined warfighting doctrine and designed units for fighting on future battlefields.[2]

ORGANIZATION

New Deputy Commanding General for Training

On 17 April 1998 Brigadier General Lawrence R. Adair replaced Brigadier General Toney Stricklin, who was being reassigned to the Office of the Deputy Chief of Staff for Operations and Plans (DCSOPS) at the Department of the Army in Washington D.C., as the Deputy Commanding General (DCG) for Training. General Adair was commissioned a second lieutenant in the Field Artillery upon graduation from the U.S. Military Academy at West Point, New York, in June 1974. From his first Army job as a reconnaissance officer and an assistant executive officer in A Battery, 1st Battalion, 92nd Field Artillery, 2nd Armored Division, Fort Hood, Texas, to his assignment as Deputy Commanding General for Training at Fort Sill, General Adair's career included a variety of command and staff assignments. He was executive officer of B Battery, 1st Battalion, 16th Field Artillery and assumed command of the battery in October 1977. After attending the Infantry Officer Advanced Course at Fort Benning, Georgia, he took command of Headquarters and Headquarters Battery, Division Artillery, 8th Infantry Division, Germany.

In 1980 General Adair served as aide-de-camp to the commanding general of the 8th Infantry Division and then served as the S3 officer for the 2nd Battalion, 81st Field Artillery. After graduating from the U.S. Army Command and General Staff College at Fort Leavenworth, Kansas, in 1982, he was assigned as a personnel staff officer, Office of the Deputy Chief of Staff for Personnel (DCSPER), Department of the Army. In 1985 he became the aide to the Secretary of the Army.

General Adair returned to Fort Hood in 1986 and served as the battalion executive officer, 1st Battalion, 3rd Field Artillery, 2nd Armored Division and then as the S3 officer for the Division Artillery. In 1988 he was appointed team chief, Readiness Group, Fort Sam Houston, Texas. In 1990 Adair assumed command of the 6th Battalion, 41st Field Artillery,

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[2]1993 USAFACFS Annual Command History (ACH), pp. 1-2.

3rd Infantry Division, Germany. From November 1990 to April 1991 he deployed with his battalion to Operation Desert Shield/Desert Storm. After his return from Germany, he was assigned as executive officer, Division Artillery, 3rd Infantry Division.

General Adair attended the National War College, Washington, D.C., in 1992 and then became the special assistant to the Secretary of the Army. In 1994 he was again assigned to Fort Hood as commander, Division Artillery, 2nd Armored Division. Since June 1996, General Adair served as the executive assistant to the Commander-in-Chief, U.S. Atlantic Command and Supreme Allied Commander, Atlantic, in Norfolk, Virginia.[3]

New Chief of Staff, U.S. Army Field Artillery Training Center and Fort Sill

[3]"Farewells, Hellos Theme of Ceremony," Fort Sill Cannoneer, 23 Apr 98, p. 1a, Doc I-1.

On 1 May 1998 Colonel David C. White became the Chief of Staff for the U.S. Army Field Artillery Training Center and Fort Sill (USAFACFS), replacing Colonel Guy M. Bourn, who was leaving to become a special assistant in the Office of the Chairman of the Joint Chiefs of Staff in Washington D.C.[4] Colonel White graduated from the United States Military Academy at West Point, New York, in 1975 and was commissioned a second lieutenant in the Field Artillery. His initial assignment was at Fort Hood, Texas, where he served in various battery-level positions in the 1st Battalion, 16th Field Artillery, 2nd Armored Division. He then moved to Fort Leavenworth, Kansas, where he was the aide-de-camp for the deputy commander of the Combined Arms Combat Development Activity. Following attendance at the Field Artillery Officer Advanced Course, he commanded C Battery, 2nd Battalion, 81st Field Artillery, 8th Infantry Division, Germany. Upon completion of command, he served as the S1 officer in the 8th Infantry Division Artillery. Upon returning from overseas, he attended the University of South Carolina where he earned a masters degree in higher education. Subsequently, he served as a tactical officer and regimental executive officer for the Corps of Cadets at the U.S. Army Military Academy. Upon graduation from the U.S. Army Command and General Staff College at Fort Leavenworth, Kansas, in 1988, Colonel White was assigned to the 8th Infantry Division where he served as battalion executive officer, division artillery adjutant, and division artillery S3 officer. His next assignment was at the Total Army Personnel Command where he supervised a Chief of Staff of the Army initiative to reduce administration in the Army. Colonel White then commanded the 3rd Battalion, 29th Field Artillery in the 4th Infantry Division at Fort Carson, Colorado. In 1994 he attended the National War College, earning a masters degree in national security strategy. In July 1995 he became the Director of the Warfighting Integration and Development Directorate at the U.S. Army Field Artillery School. Colonel White assumed duties as the commander of the 30th Field Artillery Regiment/Chief of Staff of Training Command on 19 June 1996.[5]

Deputy Commanding General-National Guard

One year after Secretary of Defense William S. Cohen, signed his "Seamless Total Force" memorandum, the U.S. Army Field Artillery Center and Fort Sill (USAFACFS) created the Office of the Deputy Commanding General-Army National Guard in 1998 with Colonel Daryl K. McCall, the former commander of the 45th Field Artillery Brigade, Oklahoma National Guard as the first person to occupy the position. Colonel McCall's responsibilities included advising the Commanding General of

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[4]Official Biography, Doc I-2; "Chief of Staff Leaves 'Home,'" Fort Sill Cannoneer, 30 Apr 98, p. 1a, Doc I-3.

[5]Official Biography, Doc I-4.

USAFACFS on training, doctrine, and combat developments as they influenced the Army National Guard and visiting Army National Guard and active component units to identify issues and solve problems. In addition, he had the duty of advising the Chief of Field Artillery, who was also the Commanding General of USAFACFS, on Army National Guard field artillery. As Deputy Commanding General-Army National Guard, Colonel McCall was scheduled to spend at least 139 days a year on active duty.[6]

MISSION SUPPORT

The Budget

[6]"ARNG Colonel Fills First School Deputy Commanding General Job," Fort Sill Cannoneer, 17 Sep 98, p. 1a, Doc I-6 "New Fort Sill Deputy Commanding General," Field Artillery, Nov-Dec 98, p. 13, Doc I-7.

In the midst of receiving its Fiscal Year (FY) 1998 appropriation budget markup in December 1997 and January 1998 that raised the installation's budget from the command operating budget estimate of $104 million to $107 million, Fort Sill still had to prepare for FY 1999. Because of the need to fund Army modernization initiatives and to maintain readiness and because of the requirement to stay within the FY 1999 Department of Defense budget, Fort Sill faced another budget cut that further hampered performing its mission of training field artillery soldiers.[7] Anticipating TRADOC budget guidance for FY 1999, the Chief of Staff for Fort Sill, Colonel Guy M. Bourn, took action. He explained on 20 October 1997, "We will do a full budget review to describe the budget base by levels of operation for key functions with related costs, output or product, and benefit."[8] Colonel Bourn then instructed each director to show the cost of key functions within their organizations and told each organization to initiate "grass roots" input to solicit changes necessary for

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[7]"Fort Sill to Face Fiscal Year 1999 Budget Cuts," Fort Sill Cannoneer, 18 Dec 97, p. 1a, 2a, Doc I-7; Memorandum for See Distribution, subj: FY 98 Appropriation TRADOC Budget Guidance, 22 Dec 97, Doc I-8; Memorandum for See Distribution, subj: FY98 Appropriation TRADOC Budget Guidance, 12 Jan 98, Doc I-9; Briefing, subj: FY98 Appropriation Markup, 15 Jan 98, Doc I-10.

[8]Memorandum for See Distribution, subj: FY 99 Budget Vision and Action Plan, 20 Oct 97, Doc I-11.

efficiencies and resource savings.[9] Ultimately, a ranking sheet would "array all functions and decrements by priority."[10]

This meant going through the zero base budget process once again. As in past years, directors had to start with a base of no money, had to estimate their needs for civilian salaries and other costs for each function within their activity, and had to stay within the budget ceiling, and this frequently involved eliminating civilian positions.[11]

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[9]Ibid.; Memorandum for See Distribution, subj: FY 99 Budget Vision Update, 2 Dec 97, Doc I-12.

[10]Memorandum for Distribution, subj: FY 99 Budget Vision and Action Plan, 20 Oct 97.

[11]1997 USAFACFS ACH, p. 4; Memorandum for See Distribution, subj: Reduction in Training Service Center Services, 8 Jul 98, Doc I-12A.

Within months Fort Sill organizations had their reduction strategies in place for review by a council of colonels and eventually by the Commanding General, Major General Leo J. Baxter. In December 1997 Fort Sill's Training Command, for example, outlined streamlining functions and gaining efficiencies by turning in equipment and reducing optemp (fuel and ammunition), while the Fort Sill garrison examined consolidating similar functions, such as merging the resource management offices in the Directorate of Community Activities (DCA), Directorate of Plans, Training, and Mobilization (DPTM), Training Command, and Directorate of Environment Quality (DEQ) under the Directorate of Resource Management (DRM).[12] As Colonel Bourn explained in the Fort Sill Cannoneer on 18 December 1997, however, Training Command's and other installation agencies' proposals were not final decisions.[13] "We are reviewing many options, and I want to stress that no decisions have been made on any reductions," the Colonel

[12]Phase one of the DRM consolidation was completed in 1998 when DCA, Field Artillery School, and DPTM resource management offices were merged under DRM. The consolidation saved nine personnel spaces and $493,000. Memorandum for Command Historian, subj: USAFACFS Annual Command History for CY 1998, 9 Feb 99, Doc I-13.

[13]Memorandum for See Distribution, subj: FY99 Budget Reviews, 30 Dec 97, Doc I-14; Briefing, subj: Training Command FY99 Budget Strategy, 17 Dec 97, Doc I-15; "Fort Sill to Face Fiscal Year 1999 Budget Cuts," Fort Sill Cannoneer, 18 Dec 97, p. 2a; Msg, Michael G. Hubbard, GD, to Col Theodore J. Janosko, Chief of Staff, Trg Cmd, subj: PLL, 8 Oct 98, Doc I-16.

pointed out.[14]

[14]"Fort Sill to Face Fiscal Year 1999 Budget Cuts," p. 2a.

In the midst of this early preparation, the Commanding General of TRADOC, General William W. Hartzog, reaffirmed the wisdom of Fort Sill's early planning initiative. On 4 December 1997 General Hartzog wrote, "The FY99 Army POM [Program Objective Memorandum] included severe reductions to TRADOC's Base Support (BASOPS [base operations], Real Property Maintenance, and Information Management Area) funding and civilian manpower."[15] He added that the Army planned to obtain a twenty percent efficiency gain in base operations manning and concomitant labor costs by accelerating and expanding the use of outsourcing and privatization by transferring functions to private enterprise. Although final decisions had not yet been made, General Hartzog warned at the time, "Execution of manpower reductions is linked to our success in gleaning savings."[16] Timely action would be required to operate at the reduced levels.[17]

Taking General Hartzog's warning to heart and following upon its own initiatives, Fort Sill had its FY 1999 budget decrement decisions in place during the first part of 1998. On 9 April 1998 the installation Chief of Staff announced that decrement decisions had been made and that post activities had to make plans to implement non-personnel decrements if possible in FY 1998 to be in position to absorb the cuts beginning on 1 October 1998 that started the new fiscal year. Recognizing that the post had not yet received official guidance from higher headquarters, Colonel Bourn announced that same day that FY 1999 budget decrement decisions would remain on hold until TRADOC budget guidance arrived.[18]

As expected, TRADOC furnished guidance. In a memorandum of 29 April 1998, it told Fort Sill that had to support the TRADOC Commanding General's priorities, that it had to keep faith with the President's budget and Army leadership priorities, that it had to provide flexibility in its budget to adjust to any potential congressional or Department of the Army (DA) reductions, that it had to formulate a budget that stayed within the allotted resources, and that it had to support the intent of the Department of the Army's philosophy and guidance on outsourcing and privatization. Although the budget would be less than the previous year, Fort Sill faced certain resource imperatives. TRADOC charged the installation

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[15]Memorandum for Cdrs, TRADOC Installations, et al subj: FY99-03 Resource Planning Guidance, 4 Dec 97, Doc I-17.

[16]Ibid.

[17]Ibid.

[18]Memorandum for See Distribution, subj: FY 99 Budget Vision Decrements, 9 Apr 98, Doc I-18.

with training the load, implementing and advancing Army Training XXI, supporting Force XXI initiatives, inventing in the future (distance learning, the synthetic environment, information infrastructure, and building demolition), upgrading unsatisfactory barracks, and adhering to health, safety, and legal requirements. Equally important, Fort Sill had to have its command operating budget to TRADOC by 9 June 1998.[19]

[19]Memorandum for See Distribution, subj: FY 99 TRADOC Budget Guidance, 29 Apr 98, Doc I-19; Memorandum for See Distribution, subj: FY 99 Command Operating Budget-Administrative Instructions, 6 May 98, Doc I-20; Memorandum for See Distribution, subj: FY 99 Command Operating Budget-OMA TRADOC Budget Guidance, 14 May 98, Doc I-21; Briefing, subj: Fort Sill Budget Facts, undated, Doc I-22; Briefing (Extract), subj: FY 99 TRADOC Budget Guidance, 21 May 98, Doc I-23; Briefing, subj: FY99 TRADOC Budget Guidance, May 98, Doc I-24; Briefing, subj: Fort Sill CG FY99 Budget Decisions, 8 May 98, Doc I-25.

After several months of intensive study and many briefings that dated back to the latter months of 1997, General Baxter announced on 12 May 1998 that he had approved the installation's command operating budget for FY 1999. The budget anticipated about $6 million less in operating funds for the coming fiscal year and the elimination of 192 civil service positions from the work force. In FY 1998 TRADOC gave Fort Sill $95 million to fund recurring expenses, which did not include the increase in budget after Congress passed the appropriations and authorization bills in the fall of 1997, whereas it intended to furnish $89 million in FY 1999. To meet the decrease the post reduced contracts, supplies, travel, and Government Service Agency leases, curtailed field training exercises, and limited off-post military training severely. The budget also outlined closing one military dining facility and consolidating three others, operating fewer buses, eliminating custodial contract and possibly using prisoners, and eliminating the Arts and Crafts Program and Center, among other things.[20] In response to the above and other actions generated by the budget reduction, General Baxter wrote in his commander's statement to the command

[20]Fort Sill Public Affairs Office New Release, 12 May 98, Doc I-26; FY99 Fort Sill, OK, Command Operating Budget, 10 Jun 98, Doc I-27; Briefing, subj: Fort Sill Budget Facts, undated; Memorandum (Draft) for Cdr, USAFACFS, subj: Commander's Statement-FY99 Command Operating Budget, undated, Doc I-28; "Sill Announces FY99 Budget Plan," Fort Sill Cannoneer, 14 May 98, p. 1a, 3a, Doc I-29; Briefing, subj: FY99 Command Operating Budget Review, USAFAS/Training Command, 9 Jun 98, Doc I-30; Briefing, subj: FY99 Vision Budget CG Approved Plan, 11 May 98, Doc I-31; Memorandum for See Distribution, subj: FY99 Command Operating Budget, 14 May 98, Doc I-32.

operating budget, "We cannot fund or fix certain major infrastructure failures or stop the serious erosion of the base infrastructure."[21]

General Baxter's closing paragraph in his commander's statement to the budget captured the reality of the FY 1999 funding cuts. He wrote:

[21]Memorandum for Cdr, TRADOC, subj: Commander's Statement--FY99 Command Operating Budget, 10 Jun 98.

> We are concerned with our ability to execute training to standard when training loads reach peak levels. This will eventually affect unit readiness in the field, and future goals to field Army XXI and Army After Next Systems. Meanwhile, our BASOPS [base operations] and infrastructure are failing and jeopardizing all training support.[22]

Although the situation was grave, General Baxter noted publicly, "The good news is Fort Sill will still be here performing its mission."[23]

As anticipated, the FY 1999 budget led to a reduction-in-force for civil service employees. To minimize the number of people losing their jobs, Fort Sill offered voluntary early retirement authority (VERA) and voluntary separation incentive program (VSIP) between 8 January 1998 and 13 February 1998 and in May 1998 and delayed filling vacant positions so that they could be filled by employees whose positions had been eliminated.[24] Although this action opened up positions to be potentially filled, the final budget plan approved by General Baxter in May 1998 identified 192 civilian positions to be abolished by 1 October 1998 as opposed to initially anticipated 226. Out of the 192 positions, civilian employees occupied 178.[25]

In light of the high number of people occupying the positions to be abolished, Fort Sill gave notices to the affected employees on 30 June 1998 and took additional action to prevent them from losing their jobs. Along with normal attrition and other aggressive actions, a VERA and VSIP opportunity offered in August 1998 and another one in October 1998 reduced the number to fifteen, who were not placed in a position.[26]

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[22]Ibid.

[23]Public Affairs Office News Release, 12 May 98.

[24]"Sill Employees Prepare for Possible Budget Reduction," Fort Sill Cannoneer, 22 Jan 98, p. 1a, Doc I-33; "Expected Budget Cuts Suspend Some Hiring Actions," Fort Sill Cannoneer, 8 Jan 98, pp. 1a, 3a, Doc I-34; "VSIP Application Window Open," Fort Sill Cannoneer, 14 May 98, p. 3a, Doc I-35.

[25]"Civilian, Military Efforts Result in Smaller RIF," Fort Sill Cannoneer, 1 Oct 98, p. 1a, Doc I-36; "RIF Team Carves Numbers from 192 to 15," Fort Sill Cannoneer, 19 Nov 98, pp. 1a, 3a, Doc I-36A; "Civilian Reduction Plan Approved," Fort Sill Cannoneer, 25 Jun 98, p. 2a, Doc I-37.

[26]"Civilian Reduction Plan Approved," Fort Sill Cannoneer, 25 Jun 98, p. 2a; "VERA/VSIP Application Window Opens," Fort Sill Cannoneer, 13 Aug 98, pp. 1a, 3a, Doc I-

38; "Civilian, Military Efforts Result in Smaller RIF," Fort Sill Cannoneer, 1 Oct 98, pp. 1a, 7a; "RIF Team Carves Numbers from 192 to 15," Fort Sill Cannoneer, 19 Nov 98, pp. 1a, 3a.

Against the backdrop of the reduction-in-force, Congress passed the authorization and appropriations bills for FY 1999, and the President subsequently signed them at the end of October 1998. Fortunately, Fort Sill received more funding than anticipated in the command operating budget of June 1998. TRADOC announced in January 1999 that the post would receive $106 million for FY 1999 for a significant increase over the June 1998 command operating budget of $89 million to fund recurring expenses.[27]

Base Realignment and Closure 1995 and Fort Chaffee, Arkansas

Although Base Realignment and Closure (BRAC) was new to Fort Sill in the mid-1990s, the process had its origins in the 1960s. Understanding that the Department of Defense (DOD) had to reduce its base structure that had been created during World War II and the Korean War, President John F. Kennedy directed Secretary of Defense Robert S. McNamara to develop and implement an extensive base realignment and closure program to adjust to the realities of the 1960s. The Office of the Secretary of Defense (OSD) subsequently established the criteria to govern the selection of bases without consulting Congress or the military. Under McNamara's guidance DOD

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[27]Briefing, subj: FY99 Appropriation TRADOC Budget Guidance, Jan 99, Doc I-39; Memorandum for See Distribution, subj: FY99 Appropriation TRADOC Budget Guidance, 7 Jan 99, Doc I-40; Msg, subj: FY99 Authorization and Appropriation, 19 Oct 98, Doc I-41; Memorandum for Command Historian, subj: Coordination of 1998 USAFACFS Annual Command History, 5 Apr 1999, Doc I-41A.

closed sixty bases early in the 1960s without Congress or other government agencies participating. In view of the political and economic ramifications of the closures, Congress decided that it had to be involved in the process and passed legislation in 1965 that required DOD to report any base closure programs to it. However, President Lyndon B. Johnson vetoed the bill. This permitted DOD to continue realigning and closing bases without congressional oversight throughout the rest of the 1960s.[28]

[28]1995 USAFACFS ACH, pp. 17-18.

Economic and political pressures eventually forced Congress to intervene in the process of realigning and closing bases and to end DOD's independence on the matter. On 1 August 1977 President Jimmy Carter approved Public Law 95-82. It required DOD to notify Congress when a base was a candidate for reduction or closure; to prepare studies on the strategic, environmental, and local economic consequences of such action; and to wait sixty days for a congressional response. Codified as Section 2687, Title 10, United States Code, the legislation along with the requirements of the National Environmental Policy Act (NEPA) permitted Congress to thwart any DOD proposals to initiate base realignment and closure studies unilaterally by refusing to approve them and gave it an integral role in the process.[29]

As economic pressures mounted, the drive to realign and close military installations intensified. In 1983 the President's Private Sector Survey on Cost Control (the Grace Commission) concluded in its report that economies could be made in base structure and simultaneously recommended the creation of a nonpartisan, independent commission to study base realignment and closure. Although nothing came of this recommendation, the defense budget that had been declining since 1985 and that was predicted to continue to decrease in coming years prompted the Secretary of Defense to take action. In 1988 the Secretary of Defense recognized the requirement to close excess bases to save money. In view of this, the Secretary of Defense chartered the Commission on Base Realignment and Closure in 1988 to recommend military bases within the United States for realignment and closure.[30]

In the meantime, Congress passed Public Law 100-526. It provided the statutory basis for a one-time base realignment and closure and furnished partial relief from certain statutory impediments. Public Law 100-526 waived a portion of NEPA requirements, delegated property disposal authority to

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[29]Ibid., p. 18.

[30]Ibid., pp. 18-19.

DOD, and expedited congressional review of BRAC recommendations. Passage of this law constituted a recognition that realigning and closing bases could save money without harming national security and that Congress would support such measures.[31]

[31]Ibid., p. 19.

The 1988 BRAC commission issued its report in December 1988. It proposed closing eighty-six military installations and realigning thirteen others. In addition, the commission designated forty-six installations for increases in mission because units and activities would be relocated to them as a result of the closures and realignments. Approved by the Secretary of Defense and Congress, the commission's recommendations led to the realignment and closure of fourteen major installations by February 1995 with other two to be realigned or closed by 2000, while seventy-seven of the eighty-six bases were closed by mid-1998 with the remaining to be closed early in the twenty-first century.[32]

The waning of the Cold War early in the 1990s reduced international tensions and the threat of war and concurrently led DOD to conclude that its budget would continue to decline even more, and this further magnified the need for realigning and closing bases. Because the base closure and environmental impact studies required under Section 2687 would take one to two years to complete, DOD developed a list of candidates for closure and realignment in January 1990. Before any real action on the studies could begin, Congress passed legislation in November 1990, and the President signed it as Public Law 101-510. The law required DOD to review its base structure without regard to the January 1990 list. Working from the BRAC experience of 1988, the new law authorized independent Presidential BRAC commissions in 1991, 1993, and 1995 to review the Secretary of Defense's recommendations for base realignment and closure in those years. Through the end of 1998, the BRAC commissions, including the 1988 one, closed ninety-eight bases in the United States bases and over six hundred overseas bases and produced an annual savings of almost $1 billion.[33]

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[32]Ibid., pp. 19-20; Information Paper, subj: Army BRAC Status, 13 May 98, Doc I-42.

[33]1995 USAFACFS ACH, p. 20; US Army Posture Statement Fiscal Year 1999, p. 64, Doc I-42A.

Outside of moving the Joint Readiness Training Center (JRTC) from Fort Chaffee, Arkansas, to Fort Polk, Louisiana, as a result of the 1991 BRAC, the BRAC process had little influence upon Fort Sill over the years. The 1995 BRAC, however, made a significant impact. In July 1995 the BRAC commission advised closing Fort Chaffee, Arkansas, a sub-installation of Fort Sill, Oklahoma, as an Active Component (AC) facility. President William J. Clinton approved the 1995 BRAC recommendations on 15 July 1995, and they became Public Law 101-510 on 28 September 1995. Based upon the law, the Commanding General of Fort Sill had to close Fort Chaffee except for the minimum essential ranges, facilities, and training areas required for a Reserve Component (RC) training enclave for individual and annual training and had to dispose of excess properties to the private sector. This involved creating a RC training enclave that would license the Arkansas Army National Guard (ARARNG) to operate it with U.S. Army Reserve (USAR) activities being tenants and realigning current tenants from Fort Chaffee. Fort Sill also had to transfer Fort Chaffee area support responsibilities to Fort Sill, establish an Arkansas Army National Guard garrison at Fort Chaffee, and cancel the installation's designation as a U.S. Army Forces Command (FORSCOM) mobilization station and contingency mission site. In addition, Fort Sill had to ensure that the property would be declared excess and would be turned over to the private sector environmentally clean.[34]

In September 1996 Fort Sill published a plan to execute the public law and to assure an orderly closure of Fort Chaffee. According to Public Law 101-510, Fort Chaffee would be closed as an AC military installation effective 30 September 1997 with the mission for maintaining the RC enclave passing to the Arkansas Army National Guard on 1 October 1997. Subsequent to that date, a federal government transition team would coordinate the disposal of all remaining excess equipment, material, and real property in coordination with the United States Property and Fiscal Office. A completion date of Fiscal Year (FY) 2001 for the disposal was established.[35]

Fort Sill's closure plan, which was a working document subject to revisions as needed, envisioned a three-phase approach to the transfer. During phase one (the planning phase), plans for the drawdown would be written. This involved writing a detailed plan of RC enclave and Fort Chaffee residual dimensions, ownership, and base operations support; producing a comprehensive plan for administering annual training for 1997; and transferring annual training for 1998 to the RC. In phase two (the transition phase) the transfer from an active Army installation to the Arkansas Army

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[34]Ibid., pp. 20-21; 1996 USAFACFS ACH, p. 16.

[35]Ibid., pp. 16-17.

National Guard operated enclave would transpire. Tenant activities could move, if necessary, to new facilities or locations. Designation of Fort Chaffee as a FORSCOM mobilization station and contingency mission site would be canceled, while administration of 1997 annual training funding would be continued by Fort Sill/Fort Chaffee. At the same time U.S. Army Garrison (USAG) support activities would turn in equipment, close buildings, prepare real property for turn in, and reduce support functions. The U.S. Army Garrison, however, would continue post support through FY 1997.[36]

[36]Ibid., p. 17.

Phase three (the caretaker phase) would last from 1 October 1997 to disposal in FY 2001. During those years, a Fort Sill transition team of sixty personnel, which would be reduced to forty personnel in the final year, would prepare Fort Chaffee's excess property for final closure, perform real property maintenance in the excess area as required, dispose of personal property, and secure government property until properly disposed. Base operations support would be assumed by the Arkansas Army National Guard for the RC enclave. Upon the completion of all required environmental cleanup for the excess property and transfers, the third phase would conclude. The separation of the transition team would mark the end of U.S. Army Garrison presence on Fort Chaffee.[37]

On 27 September 1997 a change of command ceremony closed an era at Fort Chaffee. That day, official command and control of the installation passed from the U.S. Army to the Arkansas Army National Guard when the U.S. Army Garrison was inactivated. The installation became officially known as the Fort Chaffee Maneuver Training Center.[38]

Nevertheless, Fort Sill still had vital role in Fort Chaffee operations after 1 October 1997, the official transition date. During the final phase, Fort Sill centered its attention on transferring excess, nonessential property from the U.S. Army to the Local Redevelopment Authority, a group of local community leaders. Specifically, Fort Sill's Directorate of Environmental Quality (DEQ) provided oversight to the base transition team, which had the responsibility of transferring the excess property and ensuring that environmental cleanup was properly conducted. In the meantime, the Directorate of Logistics (DOL) assisted the base transition team on logistical actions, such as property book support, while the Directorate of Contracting (DOC) furnished contracting assistance. Other Fort Sill agencies, such as the Directorate of Plans, Training, and Mobilization (DPTM),

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[37]Ibid., p. 18.

[38]1997 USAFACFS ACH, p. 10.

the Directorate of Public Works (DPW), and the Staff Judge Advocate (SJA), supplied assistance in their areas of expertise. Perhaps, the most important Fort Sill involvement centered on writing a new disposal plan to transfer excess property to the Local Redevelopment Authority.[39]

[39]Ibid.

Besides completing the disposal plan and the transfer documents on over seven hundred buildings and structures and sixty-five thousand acres to the Arkansas Army National Guard, Fort Sill continued assisting the realignment process during 1998. For example, DOL closed its transportation office, assisted in the development of caretaker table of distribution and allowance for equipment, and helped screen excess personal property. DEQ maintained oversight of the environmental clean up process and advised the commander of Fort Sill on all environmental issues, while DRM closed outstanding budget accounts and provided training to Fort Sill staff members on the BRAC process, among other things. Meanwhile, DCP expedited staffing needs of the transition team, furnished placement services for Department of the Army civilians, and personnel services for the transition team.[40]

Circular A-76 Studies and Contracting Out

Examining governmental activities to determine whether they should be contracted out or not had their origins in the 1950s. Early in 1955, the Bureau of the Budget, the forerunner of the Office of Management and Budget (OMB), formulated the policy of increasing reliance on the private sector for certain goods and services. It explained at the same time that exceptions existed. Governmental agencies could be used if their functions were considered to be inherently governmental in nature, if satisfactory commercial sources were unavailable, if national defense were at stake, or if a cost-comparison study revealed that the government could furnish the service less expensively than private enterprise could. Although the 1955 pronouncement and subsequent ones focused more attention on studying commercial activities than previously, the government turned over few functions to private enterprise. Through 1963 the government depended upon its installations and their staffs rather than private companies, especially when commercial activities were more costly. As such, cost had become the deciding factor during the years after 1955.[41]

Influenced by the drive for cost efficiency, the Bureau of the Budget issued Circular A-76 in 1966. This circular and revisions of 1967, 1979, and 1983 directed the government to solicit proposals to compare in-house and contractor costs and outlined the proper procedures for seeking offers from contractors. Equally important, A-76 reaffirmed that the government desired to rely upon private business for goods and services, that some functions had to be performed by the government because they were governmental in nature, and that relative costs would determine whether a function would be done by government employees or commercial sources. Although

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[40]Memorandum for Command Historian, subj: USAFACFS Annual Command History for CY 1998, 9 Feb 99, Doc I-43.

[41]1990 USAFACFS ACH, pp. 11-12.

the performance of the tasks to private enterprise might be transferred from the government to a commercial source if it proved to be less expensive, the Army still retained ownership of the activity.[42]

[42]1989 USAFACFS Annual Historical Review, p. 14; Memorandum for Command Historian with Encls, subj: USAFACFS Annual Command History for CY 1998, 9 Feb 99, Doc I-44.

In keeping with the drive to be more cost efficient, the Department of the Army directed in 1998 that commercial activities cost competition studies be conducted to determine the more efficient provider with the goal of reviewing forty-eight thousand civilian and eight thousand military positions from Fiscal Year (FY) 1999 through FY 2003. In compliance with the Army's directive, the U.S. Army Training and Doctrine Command (TRADOC) announced in November 1998 that command-wide A-76 studies of the Directorates of Information Management (DOIM) and Training Services Centers (TSC) would begin in FY 1999. Subsequently in December 1998, TRADOC said that Adjutant General/Military Personnel Offices (AG/MPO) would also undergo A-76 studies beginning FY 1999. The results of the DOIM, TSC, and AG/MPO studies and the ongoing study of the Directorate of Public Works (DPW) that had begun in May 1997 at Fort Sill and that was being done by a contractor, Management Analysis, Inc., would determine the most cost-effective way of doing those jobs by permitting government and private enterprise to put their most cost-efficient proposals and organizations forward for consideration.[43]

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[43]"DOIM, TSC to undergo Cost Competition Study," Fort Sill Cannoneer, 3 Dec 98, pp. 1a, 5b, Doc I-45; "AG Next Target for Cost-Competition Study," Fort Sill Cannoneer, 10 Dec 98, p. 6a, Doc I-46; "Base Ops Studied at TRADOC Posts," Fort Sill Cannoneer, 3 Apr 97, pp. 1a, 2a, Doc I-47; Msg with Atch (Extract), subj: CY98 Command History, 21 Jan 99, Doc I-48; Memorandum for Command Historian with Atch

(Extract), subj: Annual Command History, 13 Jan 98, Doc I-49; Memorandum for Command Historian with Encls, subj: USAFACFS Annual Command History for CY 1998, 9 Feb 99.

Unlike in the past when installation Directorates of Resource Management (DRM) carried out the studies without outside assistance, TRADOC decided to hire contractors to help conduct the DOIM, TSC, and AG/MPO studies. TRADOC selected this alternative because the studies were command-wide and not limited a certain post and because local DRMs had been reduced in size in response to budget cuts of recent years. Notwithstanding this fundamental change, the study concept remained constant with those of the past. Fort Sill would develop its most efficient DOIM, TSC, DPW, and AG/MPO organizations to compete with a potential contractor. The more cost-effective bid would then perform the function. Even though Fort Sill would receive contractor support on the studies, it would have to take a full and active part in the commercial activities study process, would have to take ownership of the outcome, and would have to live with the results of the studies. In view of this, Fort Sill planned to establish three installation study teams in FY 1999 to review and change, as appropriate, all study documents completed by the contractor.[44]

Fort Sill and Power Projection

The unexpected end of the Cold War at the beginning of the 1990s caused the United States to restructure its national military strategy. Rather than depending upon forward deployed military forces in Europe as it had done for over forty years, the new strategy focused on deploying military forces from the continental United States (CONUS). Equally important, the new military strategy embraced the principles of deterrence, forward presence, crisis response, and reconstitution and required Army installations, such as Fort Sill, Oklahoma, to have the ability of responding rapidly to regional crises throughout the world. To help Fort Sill fulfill its force projection requirements Congress approved an Army Strategic Mobility Program railhead in 1998 and funded it Fiscal Year (FY) 2000 budget. The program would upgrade the post's railway system and provide an improved capability to move the heavy field artillery pieces of III Armored Corps Artillery to their deployment ports and to help the installation serve as a springboard for the rapid deployment of Army forces throughout the world.[45]

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[44]"AG Next Target for Cost-Competition Study," p. 6a; "DOIM, TSC to undergo Cost Competition Study," pp. 1a, 5b; Memorandum for Command Historian with Encls, subj: USAFACFS Annual Command History for CY 1998, 9 Feb 99.

[45]1994 USAFACFS ACH, pp. 18-19; Msg, subj: Annual Command History 1998, Power Projection, 1 Mar 99, Doc I-50; U.S. Army Posture Statement Fiscal Year 1999, pp. 14-15, Doc I-42A. Following Desert Storm of 1991, the Department of Defense conducted the Mobility Requirements Study (MRS), and the Army Strategic Mobility Program, designed to implement MRS recommendations that the military could increase its

deployability through investment in prepositioned materiel, airlift, sealift, and deployment infrastructure, identified and prioritized infrastructure improvements at Key installations and ports. See U.S. Army Posture Statement Fiscal Year 1999, p. 14.

As in past years, Fort Sill, in the meantime, participated in deploying and redeploying units and individual soldiers in support of the new national military strategy in 1998. Between June 1997 and February 1998 the III Armored Corps Artillery meteorological section of thirteen soldiers deployed to Bosnia. Meanwhile, Detachment D of 215th Finance Company of twenty-one soldiers deployed to Bosnia from 6 February 1998 to 29 October 1998. In May 1998 the 62nd Engineers sent a thirty-five soldier detachment to Haiti on humanitarian construction mission for Operation Restore Hope. They constructed an eight-room schoolhouse and repaired other school facilities and returned in August 1998. In the midst of this activity, Fort Sill's emergency operations center sent over forty-seven individual soldiers in support of humanitarian and peacekeeping operations to Central and South America, Haiti, Kuwait, Egypt, and Korea and continued support to Operation Joint Guard in Bosnia by sending Stabilization Forces Three and Four.[46]

Fort Sill and Force Protection

Prompted by the Khobar Towers terrorist attack in June 1996, the Department of Defense (DOD) initiated sweeping changes to protect American forces worldwide. After conducting extensive studies in 1997, DOD developed new force protection procedures in 1998 to safeguard soldiers, civilian employees and family members, facilities, and equipment in all situations and throughout the world. As a part of this effort, Fort Sill appointed a force protection officer, Colonel Herbert G. Brown, who was also the Director of the Directorate of Plans, Training, and Mobilization (DPTM), in 1998. Under the direction of the force protection officer, the plans officer from the Plans and Exercise branch developed Fort Sill Force Protection Regulation 525-13, following Army Regulation 525-13 and U.S. Army Training and Doctrine Command supplement on force protection. The Fort Sill regulation stipulated levels of protection, training, and the formation of a force protection organization that consisted of the force protection officer, the force protection working group that started meeting in 1998, the force protection committee, and the entire Fort Sill chain of command, including III Armored Corps Artillery and Training Command.[47]

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[46]Memorandum for Command Historian (Extract), subj: Annual Historical Review, 11 Feb 99, Doc I-51.

[47]Msg, subj; Annual Command History 1998, Power Projection, 1 Mar 99.

Fort Sill's Radar Approach Control

Established in 1959, the Army Radar Approach Control (ARAC) at Fort Sill furnished air traffic control for Henry Post Airfield on Fort Sill, the Lawton municipal airport, the Duncan Haliburton Airport, and other airports in the surrounding area. Through the mid-1980s Henry Post Airfield was also home for a U.S. Army Forces Command helicopter battalion, two helicopter companies, a medical evacuation platoon, and ten to fifteen U.S. Army Field Artillery Center and Fort Sill helicopters and airplanes. However, in the mid-1980s Fort Sill started losing Army aircraft because of budget cuts. By the mid-1990s Fort Sill had lost most of its aircraft through restationing and inactivations. At the end of Fiscal Year (FY) 1996, for example, Fort Sill had only a few fixed-wing aircraft and three temporary duty medical evacuation helicopters at Henry Post Airfield.[48]

In the meantime, non-Army air traffic took up most of the Fort Sill ARAC's time. In 1995, for example, the ARAC handled 170,670 air movements. This included approaches and departures at multiple airfields and overflights. Of this total, only twenty-two percent of the flights were Army. Forty-five percent of the flights were Air Force, and thirty-three percent were civilian.[49]

In view of the budget cuts of the 1990s, the aging equipment, such as the ASR-8 airport surveillance radar that would cost several million dollars to replace, the reduction in the number of Army aircraft at Fort Sill, and the accompanying decline in Army aviation traffic, the U.S. Army had to reconsider the rationale for maintaining the ARAC. Late in 1995, the U.S. Army Aeronautical Services Agency (USAASA) reviewed the need for the ARAC and concluded that it should be closed. In January 1996 the USAASA notified the Federal Aviation Administration (FAA) of its intention to return the currently delegated approach control authority to it. The notification stated that U.S. Army would not abruptly cease approach control operations in the Lawton/Fort Sill area that might disrupt commercial or general aviation activities and also recommended the development of a transition plan.[50]

Because Sheppard Air Force Base, Texas, used Henry Post Airfield and Fort Sill's ARAC for Euro-NATO Joint Jet Pilot training, the U.S. Air Force reacted vigorously to the recommendation and pushed for some type of accommodation. After extensive negotiations in 1996-97, the U.S. Army and U.S. Air Force reached an understanding. According to a memorandum of agreement signed by both services in March 1997,

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[48]1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), pp. 11-12.

[49]Ibid., p. 12.

[50]Ibid.

Fort Sill would continue to operate the ARAC until the U.S. Air Force could install a new digital radar with a projected operational date of 2004. After that date Sheppard Air Force Base would assume control of the airspace formerly controlled by the Fort Sill ARAC and would remotely control the new radar. Also, Fort Sill would continue to operate and maintain a precision approach radar at Henry Post Airfield for the foreseeable future. Moreover, the existing level of funding by both services would continue until the U.S. Army had relinquished control responsibility to the U.S. Air Force.[51]

[51]Ibid., p. 13; Memorandum for Command Historian, subj: SME Review of Fort Sill's Radar Approach Control Portion of the 1998 Annual Command History, 23 Feb 99, Doc I-52.

Despite this agreement, large budget reductions projected for FY 1999 at Fort Sill forced the installation to reexamine the ARAC issue later in 1997. Lacking sufficient funding to operate the ARAC facility, Fort Sill leaders discussed the possibility of closing the it.[52]

Although the zero base budget process for FY 1998 permitted Fort Sill to continue operations of the ARAC facility until a staff study had been concluded to determine the best method of providing the service, operating the ARAC came at a high cost. According to budget projections for FY 1999, running the facility would cost $1.7 million. The U.S. Air Force would contribute $536,000 as specified in the memorandum of agreement signed in March 1997. This left Fort Sill to furnish approximately $1.2 million of the ARAC's operations. Because the installation had to pay for ARAC operations at the expense of other critical requirements, Fort Sill again considered closing the ARAC in FY 1999 if alternative funding could not be found.[53]

Fort Sill's decision generated a flurry of activities during the rest of 1998. Because the ARAC supported the Lawton Municipal Airport, Lawton city officials and Oklahoma's

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[52]Ibid.

[53]Ltr, Ronald E. Morgan, Acting Associate Administrator for Air Traffic Services, FAA, to The Honorable James M. Inhofe, United States Senate, Washington DC, 21 May 98, Doc I-53; Msg, subj: ARAC, 30 Nov 98, Doc I-54; Interview, Dastrup with Mitch Pinion, Dep Dir, Directorate of Plans, Training, and Mobilization (DPTM), 6 Jan 99, Doc I-55; Msg, Mitch Pinion, Dep Dir, DPTM, to Dastrup, subj: Wording of Transportation Bill, 7 Jan 99, Doc I-56.

congressional delegation acted immediately. They asked that the ARAC remain operational until an alternative funding proposal could be arranged with the Department of Transportation and FAA. In fact, Oklahoma's congressional delegation under the leadership of Senator Don Nichols got language interjected into the Transportation Appropriations Bill for FY 1999 that would require the FAA to find a means of ensuring that the ARAC would continue to operate. In view of this and FAA study scheduled to begin in January 1999 at the direction of the appropriations bill, Fort Sill and the Army opted late in 1998 to delay the decision of discontinuing ARAC operations. They wanted to see the results of the study and the congressional action to find additional funding from the FAA.[54]

Project Millennium

[54]Interview, Dastrup with Pinion, 6 Jan 99; Msg, subj: ARAC, 30 Nov 98; Fort Sill Public Affairs Office News Release, 12 May 98, Doc I-57; Memorandum for Command Historian, subj: SME Review of Fort Sill's Radar Approach Control Portion of the 1998 Annual Command History, 23 Feb 99.

During 1997 and 1998, the Fort Sill Museum focused considerable attention on planning and implementing Project Millennium, an initiative of Commanding General of the U.S. Army Field Artillery Center and Fort Sill, Major General Leo J. Baxter, to capitalize on Fort Sill's vast collection of national historic treasure, rare documents, and culturally significant art work to enhance public education, cultural awareness, scholarly work, and tourism in Southwest Oklahoma. The project consisted of eight major initiatives to improve museum operations and to provide better educational support. They included major renovations of historic buildings, such as the cavalry barracks, the guardhouse, and the Quartermaster Corral. The $25 million program also included constructing a world-class, 100,000 square foot museum complex on Army-owned land south of the National Historic Landmark Area, developing state-of-the-art interpretive and educational exhibits, incorporating a high-technology research center for academic researchers, authors, independent scholars, genealogists, and television and movie producers worldwide.[55]

In 1998 Project Millennium grew larger. With support from the civilian aide to the Secretary of the Army, General

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[55]1997 U.S. Army Field Artillery Center and Fort Sill Annual Command History, p. 13; Memorandum for Command Historian (Extract), subj: Annual Historical Review, 11 Feb 99, Doc I-58; Memorandum for Record, subj: Annual Command History Input from Garrison Commander, 19 Jan 99, Doc I-59.

Baxter expanded Project Millennium to a broader, regional mission as he sought to make the Fort Sill Museum "The National Army Museum of the Southwest."[56]

Cooperation between Fort Sill and Lawton

[56]Memorandum for Towana Spivey, Dir, Fort Sill Museum, subj: SME Review of Project Millennium for 1998 Annual Command History, 26 Feb 99, Doc I-60; Msg, subj: The National Army Museum of the Southwest, 15 Mar 99, Doc I-61.

In 1998 Fort Sill and Lawton cooperated in their efforts to improve the quality of life in the Lawton/Fort Sill community. During the year, Wings of Eagles, Army Partnership with Lawton area schools, civil aviation radar support, and other activities, for example, reaffirmed the close cooperation and ties between the two communities and built upon a past relationship. In 1980 Fort Sill and Lawton leaders organized the Lawton/Fort Sill Community Co-op Program. By affiliating military units on post with civilian firms, businesses, and civic organizations, Lawton and Fort Sill improved the bond between them through public service projects and participation in sporting and social events. Over the next several years of the 1980s, community public service projects renovated the Lawton Armed Services YMCA and the Fort Sill Child Development Center, helped elderly shut-ins with home repairs, and sponsored the annual Southwest Oklahoma Special Olympics, to name just a few.[57]

In 1998 the atmosphere of cooperation also branched off in a totally new direction. For some years Lawton leaders had explored the possibility of annexing Fort Sill because of two key reasons. First, Norman, Oklahoma, replaced Lawton as the third largest city in the state earlier in the 1990s, causing Lawton to lose some prestige. Second, business and civic leaders wanted private enterprise to relocate to their city to broaden the economic base of the city and the surrounding area. However, business leaders in the United States, who had been approached to move their companies to Lawton, insisted that it was unprofitable for them to move into a community with less than 100,000 people and, therefore, resisted relocating to Lawton because the city's population hovered around 80,000. The desire to attract private enterprise and to regain its previous ranking as the third largest city in the state prompted city officials to investigate annexing Fort Sill. This would raise the city's population to approximately 100,000, would make the city more attractive to outside business, and would restore the city's prestige. With this in mind and with support from Fort Sill officials, the Secretary of the Army, and the Oklahoma legislature, Lawton approved an ordinance on 23 June 1998 that annexed the post to the city with official annexation coming on 2 July 1998. In the upcoming census of 2000, Fort Sill residents would be counted as residents of Lawton. As an extension of the annexation, the Lawton city council later approved a motion in January 1999 to give Fort Sill a non-voting seat on the council to permit participation on matters of concern to the post and to further represent the unity of Fort Sill and Lawton.[58]

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[57]1998 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Historical Review, pp. 41-42; "Baxter Hosts City Council Meeting," Fort Sill Cannoneer, 24 Sep 98, pp. 1a, 6a, Doc I-62.

[58]"Lawton City Council Approves Annexation," Fort Sill

Cannoneer, 25 Jun 98, p. 1a, Doc I-63; Interview, Dastrup with COL D.J. Bonney, Garrison Commander, Fort Sill, 19 Jan 99, Doc I-64; "Leaders Answer Soldier Questions About Annexation," Fort Sill Cannoneer, 9 Jul 98, pp 1a, 3a, Doc I-65; "Lawton City Council Approves Fort Sill Seat," Fort Sill Cannoneer, 21 Jan 99, p. 1a.

Although the annexation's impact beyond approval of the city council seat could not be determined, it presented the possibility of improving the lives of Fort Sill soldiers and their dependents. They would benefit because new industries, attractions, restaurants, and services would most likely move into a "larger" city of more than 100,000 people.[59]

In 1998 other developments demonstrated the close cooperation between Fort Sill and Lawton. In May 1998 Fort Sill reopened the Lake Elmer Thomas Recreation Area (LETRA) after rebuilding the south spillway, enlarging and deepening the marina, building a marina wall and boat ramp, and adding two fishing jetties and two islands. As the outdoor recreation manager for LETRA explained, the facility would provide a wide variety of recreational opportunities for the entire community, including Lawton. Later in October 1998 after permitting the public to use LETRA for one day just to see what it offered, Fort Sill announced that it planned to open LETRA to the public permanently in 1999 because it was a facility that was unique in southwest Oklahoma and had the potential of hosting many events and attracting tourists. Subsequently in January 1999, Fort Sill and Lawton reached an agreement that opened LETRA to all residents of the Lawton/Fort Sill community. Fort Sill would retain all responsibility for the facility's operation, fee collection, and sales activities, while Lawton would help promote the facility as a potential tourist attraction and furnish customer feedback. Another venture, in the meantime, that demonstrated close cooperation included the formation of a Lawton/Fort Sill In-line Hockey Youth League that was scheduled to play games on the recently completed in-line hockey rink near the Officer's Club.[60]

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[59]"Leaders Answer Soldier Questions About Annexation," pp. 1a, 3a.

[60]Interview, Dastrup with Bonney, 19 Jan 99; "LETRA Opening to Offer New Opportunities," Fort Sill Cannoneer, 23 Apr 98, pp. 1a, 4b, Doc I-66; "LETRA Opens for Public Fun Day," Fort Sill Cannoneer, 1 Oct 98, p. 12a, Doc I-67; "In-line Hockey Rink, Leagues to Open," Fort Sill Cannoneer, 11

Jun 98, p. 8a, Doc I-68; "LETRA Open to All," Fort Sill Cannoneer, 21 Jan 99, pp. 1a, 5a, Doc I-69.

Towards the end of 1998, Fort Sill and Lawton announced another important joint venture when they disclosed their intention to combine Emergency 911 efforts. About four years ago, the installation identified the need to replace its 911 system with an enhanced 911 system because of population growth and the obsolescence of the existing system. After researching the cost of buying and installing the enhanced system and talking with Lawton officials, who had purchased one with the capabilities of servicing Lawton and Fort Sill, post officials examined the possibility of using it. After discussions Lawton and Fort Sill officials decided that military police would work in the city's 911 dispatching center in the municipal court building, would only answer calls from Fort Sill, and would dispatch emergency services as needed on post. Emergency personnel from Fort Sill would not respond to calls in the city, while their city counterparts would not answer calls on the post. In return for using the enhanced 911, Fort Sill agreed to furnish soldiers to help teach in the Drug Abuse Resistance Education (DARE) program in city schools. This arrangement with 911 would save Lawton and Fort Sill money.[61]

[61]"MPs Train for Enhanced 911 Response," Fort Sill Cannoneer, 14 Jan 99, pp. 1a, 2a, Doc I-70; "Enhanced 911 Goes Online Early March," Fort Sill Cannoneer, 25 Feb 99, pp. 1a, 3a, Doc I-71.

CHAPTER TWO
LEADERSHIP DEVELOPMENT:
TRAINING AND EDUCATION

INTRODUCTION

During 1998, Training Command trained officers and soldiers to employ fire support systems effectively. To accomplish this the Command instituted Army values training in initial entry training, prepared for gender-integrated training in initial entry training, continued work on Classroom XXI and Distance Learning, made additional revisions to the Field Artillery Officer Advanced Course that was renamed the Officer Career Course during the year, refined the Field Artillery Officer Basic Course, and provided new equipment training to Active and Reserve Component soldiers.[1]

ARMY VALUES TRAINING IN INITIAL ENTRY TRAINING

Early in 1997, the U.S. Army responded rapidly and positively to the sexual harassment scandals that rocked advanced individual training (AIT) at Aberdeen Proving Ground, Maryland. Taking the scandals seriously, the Chief of Staff of the Army, General Dennis J. Reimer, tasked the U.S. Army Training and Doctrine Command (TRADOC) in May 1997 to take a fresh look at how the Army conducted initial entry

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[1]1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), p. 15; Memorandum for Record, subj: How did we get here from Aberdeen? 29 Oct 98, Doc II-1.

training (IET), which included basic combat training (BCT), one-station unit training (OSUT), and AIT. As General Reimer explained, the Army needed highly trained soldiers that embodied its values, ethics, and traditions. To this end in September 1997, General Reimer approved TRADOC's plan, which was formulated during the summer of 1997, to develop and implement an additional week of training in IET that would focus on Army ethics, values, and heritage and character development. General Reimer and other senior Army leaders felt that such training would foster a common identity and lessen many of the problems facing soldiers.[2]

[2]1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), p. 15; Memorandum for Record, subj: How did we get here from Aberdeen? 29 Oct 98; Msg, Col Guy Bourn, Chief of Staff, USAFACFS, to Col Herbert G. Brown, Dir, DPTM, subj: Branch History Video Tasker, 7 Feb 98, Doc II-2; "IET: Starting the Soldier Out Right," Field Artillery, Mar-Apr 99, pp. 3-5, Doc II-2A; MG Leo J. Baxter, "IET: Where Values and Excellence Begin," Field Artillery, Mar-Apr 99, pp. 1-2, Doc II-2B; LTC Michael A. Byrd, "Army Values and Basic Training," Field Artillery, Mar-Apr 99, p. 40, Doc II-2C.

Subsequently, the Department of Army Inspector General (DAIG) and the Siegfried panel of September 1997 criticized TRADOC's initial entry training. Among other things, the DAIG and the Siegfried panel detected a lack of focus on Army values, traditions, and history and insufficient leader involvement in training. In light of the scandals, General Reimer, the DAIG, and the Siegfried panel agreed about the necessity of changing initial entry training by spending more time on the "soldierization process" but not by reducing the time spent on technical skills. A general consensus existed within the Army. Values had to be instilled in the Army's soldiers in initial entry training that would be carried with them throughout their military career.[3]

At a basic combat training/one station unit training conference in November 1997, TRADOC announced its proposed solutions in general terms, declared that the changes would be effective 1 October 1998, and pointed out that specifics would be forthcoming in February 1998. Besides recognizing the need to increase the technical quality of soldiers leaving the training base, TRADOC explained that training had to produce disciplined, team-oriented soldiers that embraced Army values and heritage. To create such soldiers TRADOC said that IET would be expanded by one week as approved by General Reimer and that the program of instruction (POI) would be revised to include more training on values, heritage, and history and to increase the contact time that chain of command and drill sergeants had with the trainees. Initial entry training also had to be more challenging, rigorous, and team-work oriented. Specifically, basic combat training would be expanded from eight to nine weeks, and advanced individual training would be lengthened a maximum of two days to accommodate the increased training on Army values, which was a high priority.[4]

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[3]1997 USAFACFS ACH, p. 15; Memorandum for Record, subj: How did we get here from Aberdeen? 29 Oct 98.

[4]1997 USAFACFS ACH, pp. 15-16; Memorandum for Record, subj: How did we get here from Aberdeen? 29 Oct 98; Baxter, "IET: Where Values and Excellence Begin," pp. 1-2; Byrd, "Army Values and Basic Training," p. 40.

Ultimately, restructuring initial entry training demanded more resources. At the November 1997 conference the commander of the U.S. Army Field Artillery Training Center at Fort Sill, Oklahoma, reminded TRADOC that "giving us a new mission without the resources only exacerbates the problem" already caused by shrinking resources, both monetary and personnel. In response, TRADOC assured the commander and other conference attendees that the resources would be available to execute the mission. As 1997 drew to a close, the commander of the training center awaited further guidance on the new initial entry training program of instruction and additional resources. The latter were never given in 1998 in light of the budget reductions.[5]

Late in 1997 and early in 1998, TRADOC issued more detailed instruction on the expanded IET and values training. The command directed the U.S. Army Field Artillery School and other branch proponents to provide subject matter experts to work with U.S. Army Training Support Center personnel and training development contractors to develop new and revised training support packages in their area of expertise. The packages would incorporate values and human relations tasks for the additional week of BCT that was scheduled to begin in October 1998. At the same time the U.S. Army Field Artillery Training Center had to revise its entire BCT program of instruction by integrating values into all training.[6]

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[5]1997 USAFACFS ACH, p. 16.

[6]Memorandum for See Distribution, subj: Training Development Support for the Additional Week in BCT, undated, Doc II-3.

Meanwhile, TRADOC directed each branch proponent to produce a ten to twenty minute branch heritage video for AIT by 1 October 1998. Through the video Fort Sill would teach branch heritage and history within the context of Army core values, discipline, and teamwork. Funded by the U.S. Army Training Support Center, the heritage video would be shown as part of branch history instruction conducted in branch museums during AIT and would highlight branch heroes that epitomized the Army values of loyalty, duty, respect, selfless service, honor, integrity, and personal courage that had been approved by General Reimer on 13 January 1998. Besides the heritage video, posters, soldier's card with the soldier's code and values, naming ranges after Medal of Honor recipients and all IET training would reinforce the Army values.[7]

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[7]Msg, Bourn to Brown, subj: Branch History Video Tasker, 7 Feb 98; Msg, subj: Army Values, 171134Z Feb 98, Doc II-4; Msg, subj: Branch History Video Tasker, 23 Feb 98, Doc II-5; Msg, subj: IET Extension-Branch History/Heritage Videotapes, 28 Jan 98, Doc II-6; "New Soldiers Take to Values Training," Army Link News, 25 Sep 98, Doc II-7; Memorandum for Record, subj: Values Training Dog Tag Card and Army Values Card, 25 Jan 99, Doc II-8; Byrd, "Army Values and Basic Training," p. 40.

Following TRADOC' direction, the U.S. Army Field Artillery Training Center integrated values training into its program of instruction. Beginning during the last months of 1998, each IET soldier received a dog tag with the Army values on it and a plastic, wallet-size card with the Army values and soldier's code on it and went through a program of instruction with values thoroughly integrated throughout it. In January 1999 the Field Artillery Training Center received copies of the branch heritage film for showing to AIT soldiers in Fort Sill's branch museum. This reoriented training promised to instill values and field artillery heritage in every soldier that passed through IET.[8]

GENDER-INTEGRATED TRAINING

On 24 and 25 June 1998 the Deputy Commanding General for Initial Entry Training at the U.S. Army Training and Doctrine Command (TRADOC), Lieutenant General William J. Bolt, visited Fort Sill. He met with commanders, observed training, and talked with noncommissioned officers and soldiers in initial entry training and one station unit training. During his visit, he announced that TRADOC was closing one of its gender-integrated training bases -- Fort McClellan, Alabama -- as a result of downsizing and had to move its chemical and military police gender-integrated training to Fort Leonard Wood, Missouri. Because Fort Leonard Wood lacked sufficient space for the additional training, TRADOC decided to move a portion of the installation's mission to Fort Sill beginning in 1999.[9]

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[8]Memorandum for Record, subj: Values Training Dog Tag Card and Army Values Card, 25 Jan 99; Memorandum for Record, subj: Values Training and Museum Visits, 27 Jan 99, Doc II-9; Memorandum for Record, subj: Field Artillery: King of Battle, 27 Jan 99, Doc II-10.

[9]"Sill Considered for Expanded Mission," Fort Sill Cannoneer, 2 Jul 98, pp. 1a, 2a, Doc II-11; MG Leo J. Baxter, "IET: Where Values and Excellence Begin," Field Artillery, Mar-Apr 99, pp. 1-2, Doc II-2B.

Although a congressionally-mandated review of gender-integrated training had not been completed, the U.S. Army announced on 29 January 1999 that Fort Sill would begin gender-integrated training in May 1999 to meet growing training requirements and the closing of Fort McClellan. To satisfy the training requirement, Fort Sill would receive approximately thirty additional female drill sergeants. Although about five thousand female recruits would be trained annually, they would not augment the current training load. The training load would remain the same, but there would be more females in the training mix.[10]

THE TOTAL ARMY SCHOOL SYSTEM

In 1998 the Total Army School System (TASS) continued as a major Army Training XXI initiative as it had been since the mid-1990s. In response to the tasking from the Chief of Staff of the U.S. Army, General Gordon R. Sullivan, to develop a Total Army School System for the twenty-first century, the U.S. Army Training and Doctrine Command (TRADOC) organized Task Force Future Army Schools Twenty-One (FAST) under the Deputy Chief of Staff for Training early in 1992. Directed by the Commanding General of TRADOC, General Frederick M. Franks, Jr., Task Force FAST had the mission of establishing an effective and efficient Total Army School System of fully accredited and integrated active component (AC)/reserve component (RC) schools that furnished standardized individual training and education for the Total Army that would be taught to a single standard.[11] Looking to the future and expounding upon his guidance, General Franks explained, "America's Army needs a cohesive institutional training system that leverages available resources and investments currently in the Total Army School System. We need a Post Cold War Total Army School System across components. As we reduce the

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[10]Msg with Atchs, subj: Gender-integrated Training, 29 Jan 99, Doc II-12; US Army Public Affairs News Release, "Fort Sill Takes on Gender-Integrated Training Mission," 4 Feb 99, Doc II-12A; Baxter, "IET: Where Values and Excellence Begin," pp. 1-2.

[11]1996 USAFACFS ACH, pp. 35-36.

size of the components, we must also reduce our institutional training investments."[12]

[12]1995 USAFACFS ACH, p. 46. See Army Training XXI in 1997 USAFACFS ACH, pp. 17-19, for background information on Army Training XXI and its relationship to the Total Army School System.

TRADOC considered such a school system to be a major break with the past. Over the years, the AC, the Army National Guard (ARNG), and the U.S. Army Reserve (USAR) had developed independent school systems with separate standards. Downsizing the Army with its attending budget reductions and the Gulf War of 1990-91 that highlighted training differences between the active component and the reserve components with latter emphasizing collective training to the detriment of individual skills made the three separate school systems uneconomical, inefficient, and anachronistic. By creating a single system and standard, Task Force FAST would abolish the existing system, create a coalition of schools, and simultaneously save money.[13]

In 1992-93 Task Force FAST organized TASS under the regional schools concept. The task force divided the continental United States (CONUS) into seven geographical regions. Each region had six colleges (brigades) to oversee instruction in leadership, officer education, health services, combat arms, combat support, and combat service support. Below the college-level the task force placed departments (school battalions). Each school battalion was aligned with an AC school and was responsible for providing instruction in specific subjects within a particular career management field. For example, the U.S. Army Field Artillery School (USAFAS) was aligned with field artillery school battalions in each region.[14]

Beginning in January 1993 and continuing into 1995, Task Force FAST organized a prototype school system in Region C to test the TASS concept and phased in the remainder of the regional schools by 1997. Composed of the states of North Carolina, South Carolina, Georgia, and Florida, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands, Region C had a regional coordinating element. The regional coordinating element established brigades and proponent-aligned battalions, utilizing the existing resources within the region, and worked to see that the region's school battalions were properly accredited. Between 1996 and 1998, USAFAS accredited Region C, Region E (Michigan, Wisconsin, Minnesota, Illinois, Indiana, and Ohio), and USAFAS field artillery school battalions to teach field artillery subjects. Accreditation permitted the field artillery school battalions and training sites to teach USAFAS courses and use USAFAS-approved courseware. In 1997 and 1998 Field Artillery School accreditation visits to Region F (Nebraska, Iowa, Kansas, Missouri, Arkansas, Louisiana, Oklahoma, Texas, and New Mexico), and Region G (California, Arizona, Utah, Nevada, Idaho, Washington, Oregon, Montana, North Dakota, South Dakota, Wyoming, and Colorado) determined that additional work was required before they could be accredited.[15]

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[13]Ibid.; 1996 USAFACFS ACH, p. 36; 1994 TRADOC Annual Command History (Extract), pp. 46-48, Doc II-13.

[14]1996 USAFACFS ACH, pp. 36-37.

[15]1996 USAFACFS ACH, pp. 37-38; Interview, Dastrup with Sharon Dorrell, WIDD, 19 Jan 99, Doc II-14; TRADOC Regulation 351-18 (Extract), Appendix C, Doc II-15.

One particular goal of TASS involved converting all instruction to Total Army Training System (TATS) courses. Through 1995 AC courses used by the RC were configured to fit the time, equipment, and facility constraints of the RC training environment. Only those tasks that were deemed important by the proponent to prepare reservists for mobilization were included in RC courses. Under TATS all critical tasks selected for AC training would be trained in the RC. In 1995-98 USAFAS converted twenty-seven field artillery enlisted courses to TATS courseware, which meant that AC and RC soldiers would be trained to the same standard, digitized them, and placed them on the Internet in 1998. At the same time the School provided TATS courseware to training institutions. Meanwhile in 1998, the School revised the Officer Advanced Course program of instruction in TATS format, put it on the Internet, signed an agreement to digitize twenty-two additional courses, and placed them on the Internet. This digitization effort complemented work on multimedia products for Captain Professional Education and an initiative began in 1998 to redesign TATS courseware to distance learning multimedia products.[16]

DISTANCE LEARNING

[16]Briefing, subj: TATS Courseware Implementation Schematic Profile Update, 1998, Doc II-16.

Following the end of the Cold War in 1990-91, Congressional funding cuts to the military services forced the Army to find innovative methods for training. Early in the 1990s, the reserve components (RC) -- U.S. Army Reserves (USAR) and Army National Guard (ARNG) -- still sent their soldiers to active component (AC) schools for training as well as depending upon their own schools for training. Because of budget cuts, the reserve components no longer had the money to send as many soldiers to AC schools for training as they had in the past. However, the reserve components still had to maintain quality training in the face of declining funding and also had to find a way of meeting their training needs. In the meantime, the U.S. Army Field Artillery School (USAFAS) and the U.S. Army Training and Doctrine Command (TRADOC) recognized that the Army would shrink in size and that the Army's reliance upon the reserve components would grow. In light of this projected restructuring in the near future, moreover, the Army National Guard would eventually have all of the reserve components' field artillery. Equally important, a decrease in funding and personnel would accompany the restructuring. Given the force projection requirements for the Army for contingency operations, the Total Army would require top quality training to execute its missions and be combat ready. This forecast of the future led to the Total Army Training Strategy (TATS) in which reserve component and active component soldiers would be trained to the same standard. Equally important, TATS gave the active component responsibility for furnishing quality standardized training to the reserve components. Ultimately, the Army planned to achieve training effectiveness and efficiencies for both the active component and the reserve components and simultaneously improve readiness in the face of a declining budget.[17]

Out of this requirement to satisfy AC and RC training requirements, the employment of state-of-the-art technology to deliver training and distance learning emerged. Initially, the Field Artillery School envisioned employing correspondence courses, training support packages, and other exportable materials to train the reserve components. However, high technology offered a better way than the traditional methods of training did. Early in the 1990s, the Department of the Army introduced the Teletraining Network (TNET). Using a satellite, TNET had the ability of sending and receiving training courses via the air waves. If they had access to the TNET, soldiers could train at their home station. This would reduce expenditures to keep them in line with the declining budgets. In December 1992 the Field Artillery School acquired TNET capabilities and immediately employed them to provide the Staff Officer Refresher Course to the reserve components. Between 1992 and 1998, the School used TNET for RC instructor training, new equipment training for active component and reserve components, Advanced Field Artillery Tactical Data System sustainment training for the 1st Cavalry Division at Fort Hood, Texas, on-demand training, fire support specialist training, and video conferences. For example, on 4-10 February 1998 the Field Artillery Officer Advanced Course 7-97 employed TNET to conduct a training exercise with students in the Armor Advanced Course at Fort Knox, Tennessee. TNET permitted live and uninterrupted communications and parallel planning between the two sites. As a result of the exercise, students wrote a brigade operational order and developed supporting battalion/task force plans for use in computer simulation games.[18]

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[17]1996 USAFACFS ACH, pp. 42-43.

[18]1995 USAFACFS ACH, p. 51; "Teletraining--Know and Sill Develop OPORD," Field Artillery, May-Jun 98, p. 45, Doc II-17; Memorandum for Chief, TNET Branch, subj: After Action Report 13F30 BNCOC (Class 1-98 and 201-98), 18 Mar

98, Doc II-18.

Based upon guidance from the Assistant Commandant and the Commandant of the Field Artillery School, in the meantime, the Directorate of Training and Evaluation (DTE), renamed Warfighter Integration and Development Directorate (WIDD) in 1995, developed a distance learning training strategy in 1994 to save money and take training to the reserve components without compromising quality. Expanding its vision beyond the more traditional approach of providing distance learning to the reserve components, the School planned to use computer-based instruction (CBI), video tapes, video teletraining (VTT), simulations, CD-ROM, and TNET to standardize and distribute training to the Total Army, especially the Field Artillery.[19]

Approved in April 1996 by the Army Chief of Staff, the Total Army Distance Learning Plan (TADLP) furnished further distance learning guidance to TRADOC and USAFAS and simultaneously tied together various ongoing training initiatives for standardization purposes. Basically, the plan envisioned shifting from a predominantly resident training environment to a mix of distance learning, self-development, and resident training by delivering standardized individual training and portions of collective and self-development training to soldiers and units at the right place and right time via advanced technology.[20] Besides including existing distance learning efforts, the plan provided coherent direction and assigned responsibilities for a broad range of training options for soldiers, leaders, and units to support their needs. Concurrently, the plan addressed training standardization throughout the Total Army School System and identified training technologies, infrastructures, and time lines required to implement distance learning throughout the force.[21]

As a critical piece of the Army Training XXI effort, the plan described seven types of distance learning facilities to be developed. They ranged from center and satellite distance learning facilities with a full training capabilities to mobile sites with only transmitting and receiving capabilities. Of the seven different facilities, Fort Sill would be designated a center and have the full range of capabilities. In the near future 138 Total Army School System training battalions also would be equipped with distance learning classrooms. Each would have the capability of transmitting and receiving training and participating in interactive simulations. In the meantime, the Army National Guard intended to equip its armories with similar distance learning capabilities.[22]

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[19]1995 USAFACFS ACH, pp. 51-52; 1996 USAFACFS ACH, pp. 44-45.

[20]Ibid., pp. 45-46; Memorandum for Director, WIDD, subj: Coordination of 1998 USAFACFS Annual Command History, 15 Mar 99, Doc II-19A. See LTC George A. Wheat, "'Distance Learning: Intelligence Training for the 21st Century," Military Intelligence, Jul-Sep 98, pp. 49-52, 61, for additional information, Doc II-18A.

[21]Ibid., p. 46.

[22]Ibid., pp. 46-47. See Army Training XXI, 1997 USAFACFS ACH, pp. 17-19, for background on Army Training

XXI.

Following the distribution of the Total Army Distance Learning Plan, TRADOC tasked service school commandants in July 1996 to develop a supporting implementation plan. In a brief memorandum on 29 July 1996, the Commanding General of TRADOC, General William W. Hartzog, told service school commandants that they had to redesign courses to be consistent with the Total Army Training System, provide distance learning classrooms, and connect to a national information telecommunications infrastructure. From General Hartzog's perspective, the quality of training "must not change" but "the means and techniques must." The commandants had to incorporate video teletraining, computer-based instruction, CD ROM, Internet, and other advanced technologies into training techniques to make distance learning a reality. Ultimately, this meant abandoning training methods that dated back to World War II, that focused on resident training, that provided nonstandard training to the reserve components and active component, and that compartmentalized training into institutional, unit, and self-development training programs. Essentially, school commandants, including Major General Randall L. Rigby of the U.S. Army Field Artillery School, had to take the Army's way of training from "platform presence to video teletraining and simulation interactivity" and "from instructor-based to student-based training." As the Army explained, the Total Distance Learning Training Plan would be harmonious with existing training initiatives -- TASS, TATS, and Classroom XXI -- and go beyond them. The plan would create "a wall-less classroom."[23]

[23]1996 USAFACFS ACH, pp. 47-48. See Memorandum for See Distribution, subj: Coordinating Draft of Army Distance Learning Operations Directive, 23 May 96, Doc II-19, for additional information.

In response to TRADOC's tasking to write an operations plan to implement distance learning strategies, the Field Artillery School completed one in October 1996 and sent it to TRADOC in November 1996. The plan detailed the process for development, execution, and management of distance learning programs for the Field Artillery and consolidated a group of existing plans. Besides announcing that all training would conform with TASS guidelines, the action plan outlined establishing modernized classrooms and providing a communications infrastructure. The plan also projected converting all training to TATS; creating multimedia training materials; maintaining task performance standards across the components; and developing, distributing, and maintaining collective training support packages for unit training. Also, the School would develop multimedia training modules for new equipment training that used distance learning facilities and equipment. Equally important, the School's plan was a living document to be updated and revised as required to meet changing conditions.[24]

Using the plan as a guide, USAFAS worked to implement distance learning in 1997-98. During 1997, USAFAS produced digitized lessons, interactive computer-based modules, and on-line training modules for field artillery MOSs. Specifically, the School completed 170 digital lessons for MOSs 13B (Cannon Crewmember), 13E (Cannon Fire Direction Specialist), and 13M (Multiple-Launch Rocket System [MLRS] Crewmember) that could be used for formal and refresher training and completed 185 digital lessons for MOS 13F (Fire Support Specialist) by mid-year. In 1998 the School finished converting MOSs 13M, 13C (AFATDS Operation Specialist), 13P (MLRS Fire Direction Specialist), and 131A (warrant officer) to TATS courseware. The lessons for MOS 13F, for example, were developed in forty-eight modules on eighteen CD-ROMs for formal and refresher training and could be ordered from the U.S. Army Training Support Center, Fort Eustis, Virginia. The lessons for each MOS contained video clips of instructors teaching, demonstrations on equipment, terrain features, and simulated exercises, while each module had a series of teaching objectives, practical exercises, and examinations and permitted student interaction at any point during the learning process. By the end of 1998, the School also had converted all twenty-seven of its field artillery enlisted courses and the Field Artillery Officer Advanced Course to TATS and put them on the Internet for reserve component and active component use. This effort moved the Field Artillery School farther along the path that would transform training from instructor-centered to student-centered, computer-generated training and propelled it further along from paper-based to multimedia module-based training.[25]

Meanwhile, the School signed an agreement in 1998 with TRADOC to redesign TATS courseware to distance learning multimedia

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[24]1996 USAFACFS ACH, pp. 48-49; 1997 USAFACFS ACH, pp. 22-23.

[25]1997 USAFACFS ACH, p. 23; Briefing, subj: TATS Courseware Implementation Schematic Profile Update, 1998, Doc II-20.

products. At the end of 1998, MOS 13B10 (Cannon Crewmember) and MOS 13P10/30/40 (MLRS Fire Direction Specialists) were in production, while MOS 13B (Paladin), 13F10/30/40 (Fire Support Specialist), and 13M10/30/40 (MLRS Crewmember) were completed.[26]

[26]Briefing, subj: TATS Courseware Implementation Schematic Profile Update, 1998.

As a part of the Department of the Army's (DA) distance learning effort, TRADOC installed three distance learning classrooms in Snow Hall, based upon a memorandum of agreement signed by TRADOC and the Field Artillery School on 15 October 1997. Funded by DA and completed late in 1998, the three distance learning classrooms provided technology to support training delivery to active and reserve component soldiers and civilians.[27]

CLASSROOM XXI

Backed with funding, the U.S. Army Training and Doctrine Command (TRADOC) launched its Classroom XXI initiative in 1995 to exploit high technology to improve classroom training. Initially, TRADOC tasked its service schools to explain how they would use the money to enhance training. Later in December 1995, TRADOC directed them to appoint a Classroom XXI point of contact and develop a Classroom XXI implementation plan during 1996. Although Training Command, U.S. Army Field Artillery Center and Fort Sill (USAFACFS), which consisted of the U.S. Army Field Artillery School (USAFAS), the Noncommissioned Officers Academy (NCOA), and the U.S. Army Field Artillery Training Center (USAFATC), was not sure how it planned to spend the money, it had ideas. In 1995 Training Command outlined expanding the use of distance learning, integrating USAFAS with other TRADOC schools, expanding the use of multimedia courseware, bringing simulations into the classroom, employing the Internet, and upgrading training in general.[28]

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[27]Memorandum for Dir, WIDD, subj: Memorandum of Agreement for Classroom XXI and Distance Learning, 15 Oct 97, Doc II-21; Interview, Dastrup with Bill Lodes, WIDD, 4 Feb 99, Doc II-22; Briefing (Extract), subj: TATS Courseware Implementation Schematic Profile, 1998; Briefing (Extract), subj: Training the Field Artillery, 28 Feb 98, Doc II-22A; Memorandum for Director, WIDD, subj: Coordination of 1998 USAFACFS Annual Command History, 15 Mar 99.

[28]1996 USAFACFS ACH, pp. 49-50.

In 1995 Training Command's concept for Classroom XXI consisted of five major elements. A TRADOC term, Campus Area Network (CAN) would connect the various USAFAS buildings into one communications network, while the Local Area Network (LAN), a Training Command concept, would be the communication technology inside the buildings. The CAN and LAN formed the backbone of Classroom XXI, while simulation-enhanced instruction classrooms to permit greater use of simulations, multimedia-enhanced instruction classrooms to furnish more effective and varied training, and computer-enhanced instruction classrooms would provide the trimmings. Training Command planned to convert existing classrooms in Snow Hall to simulation-enhanced instruction classrooms and multimedia-enhanced instruction classrooms in Fiscal Year (FY) 1996 but would not introduce computer-enhanced instruction classrooms until FY 1997 because the School was still developing the instruction.[29]

In 1996 and 1997 Training Command employed high technology to meet Classroom XXI guidelines, to enhance resident instruction, and to support the Total Army School System (TASS). Using a fiber optics CAN, it tied Knox Hall, I-See-O Hall, Snow Hall, Searby Hall, Summerall Hall, and Burleson Hall (all were part of the USAFAS campus) into one communications network, completed LANs in each respective building, and implemented the Internet link.[30]

In 1997 Training Command continued implementing its Classroom XXI plan of 1996. Basically, the plan continued the initiatives started in 1995-96 and refined them. That year Training Command expanded the CAN and LAN to the Field Artillery Training Center and the Noncommissioned Officers Academy and connected them to the television network (TNET), the simulation center, and the Internet. Training Command also had eleven level-one classrooms with multimedia overheads, access to the LAN, video recorders, large-screen televisions, and instructor computer work stations; had one level-two classroom with computer-based instruction capabilities using CD ROM, LAN connections, and access to the World Wide Web; had two level-three classrooms with multimedia computers and video teletraining capabilities with two-way audio-video possible between Fort Sill and remote training sites; and had two level-four classrooms with the Janus simulation system and the ability to send and receive simulated training exercises.[31] The fiber optics networks, the Internet, CD-ROM,

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[29]Ibid., pp. 50-51.

[30]Ibid., pp. 51-53.

[31]Ibid., pp. 52-53; Briefing (Extract), subj: Training the Field Artillery, 28 Feb 98, Doc II-22A.

and other technologies of the Classroom XXI modernization effort that was planned to continue into Fiscal Year 1999 would provide Training Command with worldwide access to digital information, training, and simulations.[32]

[32]1996 USAFACFS ACH, pp. 51-52; 1997 USAFACFS ACH, p. 25; Memorandum for Director, WIDD, subj: Coordination of 1998 USAFACFS Annual Command History, 15 Mar 99, Doc II-19A.

In October 1997 the Field Artillery School signed a memorandum of agreement with TRADOC to bring one Digital Training Access Center (DTAC) on line, to install three Distance Learning classrooms, and to install two level-one classrooms and one level-three classroom. Classroom XXI would support institutional resident training and serve as a platform to export resident training to distance learning facilities, while Distance Learning classrooms would provide the ability to deliver training to active component and reserve component soldiers and civilians with access to distance learning facilities. The Digitized Training Access Center would electronically store and distribute the digital proponent record copy of approved training materials.[33] Funded by the Department of the Army, TRADOC installed three Distance Learning classrooms at Fort Sill late in 1998 and a Digital Training Access Center to store the digital proponent record copy of approved training materials.[34]

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[33]Briefing (Extract), subj: Training the Field Artillery, 28 Feb 98; Memorandum (Extract) for Director, WIDD, subj: Memorandum of Agreement for Classroom XXI and Distance Learning, 15 Oct 97, Doc II-23.

[34]Briefing, subj: TATS Courseware Implementation Schematic Profile Update, 1998, Doc II-24; Memorandum for Dir, WIDD (Extract), subj: Memorandum of Agreement for Classroom XXI and Distance Learning, 15 Oct 97; Interview, Dastrup with Bill Lodes, WIDD, 4 Feb 99, Doc II-25; Briefing, subj: Classroom XXI, Feb 99, Doc II-26; Memorandum for Director, WIDD, subj: Coordination of 1998

USAFACFS Annual Command History, 15 Mar 99.

Over the past fifteen years, field artillery warrant officer career fields experienced tremendous changes in response to new technology and doctrine. Approved by the Chief of Staff of the Army in June 1985, the Total Warrant Officer Study revised warrant officer career management, created the rank of Chief Warrant (CW) Officer 5 (master warrant officer), classified warrant officer requirements by rank, and redefined warrant officer responsibilities. Beginning in 1985 warrant officers had to be technically as well as tactically proficient whereas in the past they had focused their most of their attention on being technically competent. The transition from being primarily concerned with technical expertise to technical and tactical proficiency, however, moved slowly. By the early 1990s Army expected warrant officers to be tactically and technically competent.[35] In the meantime, technology transformed warrant officer career fields within the Field Artillery. The Field Artillery received its first warrant officers in 1948 to serve as tactics and gunnery instructors and maintenance officers. A few years later, the branch added fire control assistants and weather warrant officers. As rockets and missiles were introduced, the Field Artillery appointed warrant officers to support those new weapon systems. During the 1960s, 1970s, and 1980s, the elimination of obsolete field artillery systems and the concurrent introduction of new ones caused warrant officers to shuffle between closing and opening fields with regularity. Given this scenario, the number of field artillery warrant officer military occupational specialties (MOS) fluctuated greatly with some lasting only a year. Of the five active field artillery MOSs in the mid-1980s, only MOS 131A, Target Acquisition Radar Technician, survived into the 1990s. The others were eliminated with the changes in technology and weapon

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[35]"Redlegs' Career Update: Officers, Warrant Officers, and Noncommissioned Officers," Field Artillery, Dec 87, pp. 48-54, Doc II-27; CW3 James A. Markestad, "Warrant Officers: The New WOs for the Total Force," Field Artillery, Dec 90, pp. 39-42, Doc II-28; Memorandum for MAJ William C. Burrell, FSCAOD, USAFAS, subj: SME Field Artillery Warrant Officer Courses for 1998 Annual Command History, 5 Mar 99, Doc II-29.

systems.[36]

In keeping with the 1985 decision made by the Army to make warrant officers tactically and technically competent, the Warrant Officer Leader Development Action Plan, approved by the U.S. Army Training and Doctrine Command (TRADOC) in February 1992, mandated

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[36]"Redlegs' Career Update: Officers, Warrant Officers, and Noncommissioned Officer," pp. 48-52; Markestad, "Warrant Officers: The New WOs for the Total Force," p. 39; Briefing, subj: Target Acquisition in Transition, ca. 1991-92, Doc II-30; Briefing, subj: Fire Support, ca. 1992, Doc II-30A; Briefing, subj: Fire Support, ca. 1993, Doc II-31. The active MOSs were 130A, Pershing, 130B, Lance; 131A, Target Acquisition; 131B, Remotely Piloted Vehicle; and 132A, Meteorology. See Markestand, "Warrant Officers: The New WOs for the Total Force," p. 39.

changes in warrant officer training. The plan completely renamed and revised the Warrant Officer Training System. The new Warrant Officer Education System replaced the old system, established quality control for the accession of warrant officers, and provided education and training at the appropriate time. To accomplish this, the plan created the Warrant Officer Candidate School to supplant the Warrant Officer Entry Course, the Warrant Officer Basic Course for WO1 and CW2, the Warrant Officer Advanced Course for CW2(P) or CW3, the Warrant Officer Staff Course for CW3(P) or CW4, and the Warrant Officer Senior Staff Course for CW5 and directed service schools to shift their training emphasis from producing technically competent warrant officers to developing technically and tactically proficient warrant officers.[37]

[37]Memorandum with Encls for CW5 Joseph Stephens, subj: Training Documents for 131A Warrant Officer Courses, 8 Dec 92, Doc II-32; Memorandum with Encls for Dir, Directorate of Training Development (DOTD), subj: Course Administrative Data for 131A Courses, 16 Dec 92, Doc II-33.

For the U.S. Army Field Artillery School the plan generated major changes in warrant officer MOS structure, courses, and training. First, the Field Artillery School revised MOS 131A. In 1991-92 the School converted MOS 131A from Target Acquisition Radar Technician to Target Acquisition Technician to reflect the shift in focus and to make the technician a specialist in radar operations and the targeting process. In May 1993 the Department of the Army approved a phased implementation of the restructured MOS to take place over four to six years beginning in Fiscal Year (FY) 1995.[38] In the meantime, the School changed the name of its Warrant Officer Technical/Tactical Certification Course to the Warrant Officer Basic Course (WOBC) and the Senior Warrant Officer Training Course to the Warrant Officer Advanced Course (WOAC) late in 1992 and early 1993 for MOS 131A,. Last, the Field Artillery School restructured training. As the School explained in December 1992, the new focus on tactical and technical competency was critical because doctrine dictated that field artillery warrant officers in the future would be crucial to the successful integration of the targeting process into the commander's

[38]"FA Warrant Officer Restructure Approved," Field Artillery, Aug 93, p. 37, Doc II-34; Memorandum for Dir, DOTD, subj: Course Administrative Data for 131A Courses, 16 Dec 92; Memorandum for CW5 Joseph Stephens, subj: Training Documents for 131A Warrant Officer Courses, 8 Dec 92; "The Radar Technician and His Role," Field Artillery, Jul-Aug 96, p. 2, Doc II-35; Msg, subj: WO Transition Course, 26 Feb 99, Doc II-36.

estimate of the situation and to successful fire support for the combined arms team as targeting officers and radar chiefs at various echelons of command. To reach this objective the School revamped WOAC over a period of several years and developed training to make warrant officers thoroughly proficient in the targeting process and fire support tactics, techniques, and procedures. In 1997 and 1998 the School conducted a pilot test of the new WOAC course to determine what modifications should be made if any and planned to integrate any changes into the course in 1999.[39]

[39]Memorandum with Encls for CW5 Joseph Stephens, subj; Training Documents for 131A Warrant Officer Courses, 8 Dec 92; Memorandum with Encls for Director, Directorate of Training Development (DOTD), subj: Course Administrative Data for 131A Courses, 16 Dec 92.

For warrant officers, who were going to fill targeting slots after 1993 and prior to attending further formal training, the Field Artillery School, meanwhile, developed and taught the Target Acquisition Warrant Officer Interim Transition Course beginning in FY 1995. Consisting of a correspondence phase and a resident phase, the course, which was only temporary and was intended to be eliminated when it was no longer needed, taught targeting, fire support organizations and procedures and fire support tactics, techniques, and procedures. However, no students ever attended the course. This caused the School to cancel it and to employ mobile training teams in its place. Unlike the ill-fated Interim Transition Course, the mobile training teams experienced success training warrant officers in targeting.[40]

FIELD ARTILLERY OFFICER BASIC COURSE RESTRUCTURE

[40]Memorandum with Encls for Dir, DOTD, subj: Course Administration Data for 131A Courses, 16 Dec 92; Memorandum for CW5 Joseph Stephens, subj: Training Documents for 131A Warrant Officer Courses, 8 Dec 92; "WO 131A Targeting Transitioning Course," Field Artillery, Jan-Feb 96, p. 7, Doc II-37; Interview, Dastrup with MAJ William C. Burrell, Chief, Target Acquisition Division, Fire Support and Combined Arms Operation Department, 26 Jan 99, Doc II-38; USAFAS Schedule of Classes FY99 (Extract), Doc II-39; Msg, subj: WO Transition Course, 26 Feb 99.

Influenced by the declining budget and the high attrition rate of second lieutenants, the Assistant Commandant of the U.S. Army Field Artillery School (USAFAS), Brigadier General William J. Lennox, Jr., in 1996 directed the Field Artillery Officer Basic Course (FAOBC) to be revised for the fourth time in four years. As it existed in 1996, FAOBC consisted of three phases. Lasting the first seven weeks, the first phase focused on platoon leader skills and had two field training exercises -- Smell Cordite and Rolling Thunder. In phase two (the eighth through thirteenth week) the students received training in basic gunnery (manual and automated) and basic fire support and underwent one field training exercise -- Battle King. During phase three (fourteenth through twentieth week), the School taught more gunnery and fire support and conducted a field training exercise -- the Redleg War. Although this produced qualified Field Artillery second lieutenants, General Lennox wanted FAOBC to focus on fire support officer skills, fire direction officer skills, and platoon leader skills because they would be required by newly commissioned second lieutenants in their initial Field Artillery assignments. At the same time the General wanted to increase the level of training achieved by graduating FAOBC students without increasing the length of the course that was dictated by the U.S. Army Training and Doctrine Command (TRADOC) and could not be altered. He also desired to replace the requirement for follow-on courses on the Multiple-Launch Rocket System (MLRS) and the Paladin M109A6 self-propelled 155-mm. howitzer with a track system that prepared officers for duty with light artillery units, heavy artillery units, or MLRS units.[41]

To improve the quality of FAOBC graduates and to reduce attrition, the School with the Gunnery Department taking the lead modularized the course, developed a track system as desired by General Lennox, tied it to a mentoring program that had been initiated earlier in 1996 to take advantage of experienced leaders, who could help new second lieutenants make the transition to army life, and to reduce high student recycling and termination of commission rates in FAOBC, and implemented the revised course in 1997. Although it retained the three phases, the School divided the course into four major modules (fire direction officer, fire support officer, platoon leader, and common core), subdivided them into smaller blocks of like subjects, and reduced the number of field training exercises from four to

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[41]1997 USAFACFS ACH, pp. 26-27; Msg, subj: FAOBC Input for Annual History-Reply, 19 Jan 99, Doc II-40. In 1996 the Field Artillery School revised FAOBC for the fourth consecutive year. See previous USAFACFS Annual Command Histories for additional information and Memorandum for See Distribution, subj: Changes to Field Artillery Course Curricula, 22 May 95, Doc II-41, and "USAFAS Curriculum Revisions," Field Artillery, Sep-Oct 95, p. 45, Doc II-42, for background information.

two in 1997 and eventually from two to one field training exercise in 1998. The school eliminated the field artillery exercise with self-propelled howitzers because of costs and a declining budget but retained the light field training exercise. Moreover, as a result of the 1996 reforms, students had to pass each module examination with at least a seventy percent whereas under the previous rules they had to pass every test with a seventy percent and had to retake a failed test until a passing grade was achieved. Although the new policy abolished the requirement for a mandatory retest after a test failure, it established the practice of retraining after a test failure, which was less threatening to the students. Also, if the student failed to maintain a seventy percent grade point average in the module or if the student reached a point where the person could not attain a seventy percent grade point average, the School could recycle the individual into a following FAOBC to give the individual another opportunity to learn the material and pass the module examination.[42]

[42]1997 USAFACFS ACH, p. 27; Interview, Dastrup with Michael Hubbard, Dep Dir, GD, and Fred Rowzee, Dir Ops, GD, 10 Dec 98, Doc II-43; Briefing, subj: Field Artillery Officer Training and Education, Jan 99, Doc II-44; Msg, subj: FAOBC Input for Annual History-Reply, 19 Jan 99; LTC Britt E. Bray and MAJ William M. Raymond, Jr., "Redleg Mentor Program: Sharpening the Sword, Nurturing the Spirit," Field Artillery, Mar-Apr 99, pp. 10-11, Doc II-44A; "OBC: Training the New Lieutenant," Field Artillery, Mar-Apr 99, p. 35, Doc II-44B.

Rather than recycling the student, the School developed a floating module for failing students to receive additional training from a pool of instructors, knowing that it had advantages and disadvantages. On the negative side the School projected that the floating module would be time consuming, would be labor intensive, and would create a heavy workload on instructors and students because the latter still had to complete their regular class load. Even so, the floating module held out the hope of reducing the number of students being recycled and halting the upward spiral in the attrition rate.[43]

Along with the module system as a whole, the mentoring program, and the new testing policy, the floating module produced mixed results in 1997 and 1998. On one hand, it reduced the attrition rate by providing remedial individualized instruction with a small instructor-to-student ratio that led to higher pass rates. As a whole, the modular system produced a well-prepared second lieutenant, met with success, according to feedback from the field, and led to an influx of officers who chose Field Artillery as one of their top selections. On the other hand, the floating module required extra instructor time with the student, was based upon the availability of instructors as projected in 1996-97, and removed the student from the block that the individual was in, causing the person to miss valuable instruction.[44]

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[43]1996 USAFACFS ACH, p. 55; 1997 USAFACFS ACH, p. 27; Interview, Dastrup with Hubbard and Rowzee, 10 Dec 98.

[44]"Field Artillery Training Command," Field Artillery, Nov-Dec 98, p. 32, Doc II-45; Interview, Dastrup with Hubbard and Rowzee, 10 Dec 98; Briefing, subj: Field Artillery Officer Training and Education, Jan 99; Msg, subj: FAOBC Input for Annual History-Reply, 19 Jan 99; Bray and Raymond, "Redleg Mentor Program: Sharpening the Sword, Nurturing the Spirit," pp. 10-11.

In view of the demands that the floating module created, the Field Artillery School searched for a viable alternative in 1998. One course of action involved instituting a "non-punitive," one-time retest. If a student failed a test, the person would attend mandatory training one night during the week and report to a test site on Saturday for retesting. If the student failed with a less than seventy percent score, the individual would retain the original score and move onto the next module. If the individual passed with a seventy percent or better, the person would still move to the next module. This course of action would provide for retraining and retesting and prevent recycling the student into the floating module. Course of action two called for the same retesting procedures as in the first option but with some differences. If the student's average fell below the seventy percent mark, the person would stay with the class until the Redleg War at the end of the course and then would be recycled. This would afford the opportunity of seeing all instruction before returning to the portion failed and starting again. In the third course of action, the School delineated maintaining the current practice of no retests, recycling when the average dropped below seventy percent, and clearly defining what the floating module should be. Some instructors advocated complete retraining of the module, while others supported retraining only those parts where the failures occurred. After careful consideration of all the options, the School chose number one because it would eliminate the floating module, provide a more timely picture of student progress and ability, and keep attrition low.[45] To abolish the requirement for students to attend a follow-on course for the MLRS or the Paladin, the School developed three tracks in 1996 with implementation in 1997. During the last week of FAOBC, students would attend the MLRS, the Paladin, or the light artillery track, depending upon their first assignment after graduation. This step integrated MLRS and Paladin training into the FAOBC program of instruction and saved money at the same time. In 1998 the School expanded the MLRS track from four to eight days to furnish additional training. Rather than having students that were going to MLRS units as their first assignment participate in the Redleg War that was light and heavy force-oriented, the School removed them from the exercise for additional MLRS training. Along with the modular concept, the three tracks produced a significantly restructured FAOBC and a qualified second lieutenant.[46]

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[45]Msg, subj: FAOBC Input for Annual History-Reply, 19 Jan 99.

[46]1997 USAFACFS ACH, pp. 27-28; Interview, Dastrup with Hubbard and Rowzee, 10 Dec 98; Interview, Dastrup with MAJ John J. Sweeney, Chief, Officer Instruction Branch, GD, 13 Jan 99, Doc II-46; Briefing, subj: Field Artillery Officer Training and Education, Jan 99.

Just after the Field Artillery School implemented its new modularized FAOBC course in 1997, the U.S. Army Training and Doctrine Command (TRADOC) distributed the second phase of its three-phase common core restructure in 1998. Phase one, which TRADOC distributed in June 1998 for implementation in October 1998, directed the Field Artillery School and other service schools to train certain tasks that all second lieutenants should know, such as land navigation, preparation for a nuclear, biological, or chemical attack, among others. Phase two, which the Field Artillery School received in September 1998 and implemented in January 1999, expanded the number of common core tasks to be taught to include the Army's policies on equal opportunity and sexual harassment, values training, and military justice, to name a few. Because TRADOC did not expand the length of its officer basic courses to accommodate the additional instruction, the Field Artillery School had to teach phase one and phase two common core tasks within the existing twenty-week schedule. To do this the School integrated the tasks into existing training.[47]

In the meantime, a Field Artillery School video teleconference in November 1996 with Combat Training Center personnel and field commanders revealed deficiencies in light force training for second lieutenants that led to changes in FAOBC. As the conference indicated, second lieutenants had difficulties conducting land navigation, determining target location, and using indirect fires in restrictive terrain. In response to the needs highlighted by the teleconference, the Basic Fire Support Branch and the Combined Arms Division in the Fire Support and Combined Arms Operations Department (FSACOD) introduced the Lightfighter Fire Coordination Exercise (later renamed the Dismounted Fire Support Officer Fire Coordination Exercise) in June 1997 to expose future company fire support officers to the intricacies of fire support in the light forces.[48]

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[47]Interview, Dastrup with MAJ John J. Sweeney, Chief, Instruction Branch, GD, 13 Jan 99; Interview, Dastrup with Hubbard and Rowzee, 10 Dec 98; Memorandum for Record, subj: Fire Support Officer, 13 Jan 99, Doc II-47; Briefing, subj: FAOBC Common Core, Jan 99, Doc II-48.

[48]1997 USAFACFS ACH, pp. 28-29; Fact Sheet, subj: Fire Support Officer Lane, 27 Jan 99, Doc II-49; Fact Sheet, subj: Dismounted Fire Support Officer Fire Control Exercise, Feb 98, Doc II-50.

As of mid-1997, the four-hour Dismounted Fire Support Officer Fire Coordination Exercise followed classroom instruction that addressed the deficiencies and other light fighter tasks and permitted FAOBC students to apply their course knowledge. Prior to the exercise, the instructors briefed the students on an operations order that was based upon an air assault task force conducting a deliberate attack of an isolated enemy company position. Although the air assault was notional, students developed their initial plan for fires. The day prior to the exercise, students conducted a leader's reconnaissance of the area of operations, finalized their plans, and conducted task force rehearsals. On the day of the actual exercise, students assumed the roles of three company fire support headquarters and their respective observer parties. Upon arrival at the landing zone, the students carried out pre-combat checks and a radio rehearsal of their fire plans and then implemented them. From the line of departure, the students navigated a 3.5 kilometer lane while being attacked and engaging the enemy with indirect fires. Once the objective had been secured, the students developed a quick-fire plan based on an enemy counterattack and then participated in a detailed after action review.[49]

After two iterations of the exercise, the FSCAOD enhanced it in the fall of 1997. The Department revamped a four-hour block of instruction that had been dedicated to Janus simulation training into a three-station exercise to prepare for the Dismounted Fire Support Officer Fire Coordination Exercise. Each station provided critical training and rehearsals to enhance the actual exercise. The Dismounted Fire Support Officer Fire Coordination Exercise usually occurred the day after the leader's reconnaissance. During the exercise, which had been expanded from four to eight hours to provide more training opportunities, FAOBC students finalized and briefed their plans based upon their rehearsals and company-level planning, implemented them, and participated in an after action review. In addition, XVIII Airborne Corps units and the Joint Readiness Training Center at Fort Polk, Louisiana, provided observer/controller support for each class. As the Director of FSCAOD explained, the exercise replicated the stresses and challenges of providing fire support in a light force environment.[50]

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[49]1997 USAFACFS ACH, p. 29; Fact Sheet, subj: Dismounted Fire Support Officer Fire Control Exercise, Feb 98; Fact Sheet, subj: Fire Support Officer Lane, 27 Jan 99.

[50]1997 USAFACFS ACH, pp. 29-30.

In 1998 FSCAOD made another major revision in the Dismounted Fire Support Officer Fire Coordination Exercise. Reviewing the existing the exercise's program of instruction revealed that it did not include cross-boundary fire support coordination that was essential for all fire support officers to be able to conduct and that the exercise had to be more contingency oriented. Upon reaching this latter conclusion, FSCAOD reoriented the exercise to make it a movement to contact exercise because such a scenario would better replicate a common light battalion mission and incorporated cross-boundary coordination. This led to an eight-hour, four-phase exercise, using XVIII Airborne Corps artillery and Joint Readiness Training Center fire support officers and sergeants to assist FSCAOD instructors, that contained the approach march and the search and attack. Beginning in January 1999, all OBC second lieutenants would go through the exercise even though their first assignment might be with a heavy unit.[51]

CAPTAIN PROFESSIONAL MILITARY EDUCATION

Desiring to improve officer professional military education so that it developed innovative leaders for Force XXI, the Commanding General of the U.S. Army Training and Doctrine Command (TRADOC), General William W. Hartzog, directed the Officer Advanced Course (OAC) at the various TRADOC service schools and the Combined Arms Services Staff School (CAS3) at Fort Leavenworth, Kansas, to be revamped. In October 1994 he tasked the Deputy Commandant of the U.S. Army Command and General Staff College (CGSC) to review ways to gain efficiencies in Captain Professional Military Education (CPT PME). Based on the CGSC study of 1990-91 and the subsequent work of the TRADOC Reengineering Study of 1993-94, the Deputy Commandant and the Command and General Staff College developed a concept of merging OAC and CAS3 into a twenty-week course that would be preceded by a non-resident phase. This study then formed the basis of the 1995-96 TRADOC Deputy Chief of Staff Training CPT PME Study that was conducted in conjunction with the branch service schools. The CPT PME study recommended improving the synchronization of training with assignments to eliminate disruption to units and concurrently advocated abandoning the existing two-course CPT PME that was composed of OAC and CAS3 for a single captain's career course.[52]

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[51]Interview, Dastrup with MAJ Jim Ekvall, Chief, Basic Fire Support Branch, FSCAOD, 27 Jan 99, Doc II-51; Fact Sheet, subj: Fire Support Office Lane, 27 Jan 99; USAFAS, Lesson Plan for Dismounted Fire Support Officer Fire Coordination Exercise, Jan 99, Doc II-52.

[52]1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), p. 30.

Understanding the need to revamp professional education for captains, General Hartzog endorsed the CPT PME study and desired that all captains would eventually receive their professional education at one location. Because the General recognized that getting there would be a challenge, he embraced the study's four-phase approach to transition from a two-course to a single-course CPT PME and gained approval from the Chief of Staff of the Army on 27 July 1996 to implement the plan through phase two that would begin on 1 October 1996.[53] Phase one would maintain the status quo and officially ended when CAS3 Class 96-5 graduated on 9 October 1996. This meant that officers would have one or two operational assignments after OAC before attending the nine-week CAS3 on a temporary duty basis. While phase two delineated retaining the twenty-week OAC, it also outlined developing a six-week CAS3 program of instruction (POI) that would be synchronized with OAC by aligning its start dates with OAC end dates and would be implemented between Fiscal Year (FY) 1997 and FY 1999. According to this plan, captains would attend CAS3 immediately after graduating from OAC with an entire OAC class attending the same CAS3. During phase three, a single, three-phase captain career course would be initiated in FY 1999 and would employ distributive education for common core and other appropriate subjects. Phase four would exploit technology and would be concurrent with phase three. Equally important, General Hartzog's "glide path" would permit keeping the best aspects of the current system if technology proved to be too expensive or incapable of replicating the personal interaction that was fundamental to leader development.[54]

Only phase two directly influenced the U.S. Army Field Artillery School (USAFAS) in 1996. Because Fort Leavenworth planned to have seven CAS3s in FY 1997 and because General Hartzog ideally wanted OAC graduates to flow directly into a CAS3 class by synchronizing OAC end dates with CAS3 start dates, USAFAS examined its FY 1996 and FY 1997 OAC schedules. To preclude dramatic rescheduling, the School noted that its current OAC schedule could be retained and feed into some CAS3 classes. For example, OAC 1-97 would graduate on 28 March 1997, and CAS3 4-97 would start on 9 April 1997. Also, OAC 2-97 would end on 20 June 1997, and CAS3 would begin on 29 July 1997.[55]

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[53]Ibid., pp. 30-31; Memorandum for See Distribution with Encl, subj: CPT PME Action Plan, 7 Aug 97, Doc II-53.

[54]1996 USAFACFS ACH, pp. 56-57; 1997 USAFACFS ACH, p. 31; Memorandum for See Distribution with Encl, subj: CPT PME Action Plan, 7 Aug 97; Memorandum for Record, subj: CPT PME, 12 Apr 99, Doc II-53A.

[55]1997 USAFACFS ACH, p. 31.

Early in February 1996, the School offered another alternative to meet the intent of the General's guidance. It could increase the number of OACs per fiscal year from four to seven and align them to match up with CAS3 classes. For example, OAC 3-96, the first class under the new system, would report on 28 May 1996 and end on 18 October 1996. Subsequently, CAS3 1-97 would begin in 22 October 1996. Thus, at the beginning of 1996, two viable options existed to align OAC with CAS3. One preserved the existing schedule of four OAC classes per year and would make fewer demands on school resources, while the other would provide seven OAC classes and would strain USAFAS resources.[56]

Although USAFAS expressed concerns in February 1996 about the scheduling, personnel, and equipment costs associated with implementing phase two, TRADOC pressed forward executing the Commanding General's directions. In August 1996 TRADOC reaffirmed that officers should move directly from OAC to CAS3 so that an entire OAC graduating class would attend the same CAS3, even though exceptions existed. "If a branch career path calls for an officer to proceed from an OAC to a follow-on specialty or functional course, synchronization should be based on CAS3 attendance after the follow-on course," TRADOC explained.[57] By taking this position TRADOC recognized the Field Artillery School's concern about the necessity of follow-on courses and the difficulty of scheduling an entire OAC into one CAS3.[58]

At the end of 1996, USAFAS indicated that phases one and two had been implemented and that phases three and four were being planned in greater detail than previously. In October 1996 USAFAS began conducting seven courses each year and linked them with CAS3. Simultaneously, the U.S. Army Command and General Staff College reduced CAS3 from a nine-week to a six-week course by eliminating approximately ninety hours of training and increased the CAS3 iterations from five to seven per year. As of 1996, phase three essentially would synchronize the common core subjects required by TRADOC, the Field Artillery OAC POI, and the CAS3 POI into an integrated career course. The course would be broken into two weeks of common core, sixteen weeks of fire support and field artillery subjects, and six weeks of CAS3. The major impact on USAFAS would be reducing OAC from twenty weeks to eighteen weeks to train officers on the critical

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[56]Ibid., pp. 31-32.

[57]Ibid., p. 32.

[58]Ibid., p. 32.

tasks required for battery command, fire support officer at the battalion and brigade levels, and staff duties at battalion, brigade, and division level.[59]

[59]Ibid.; Memorandum for See Distribution with Encls, subj: CPT PME Action Plan, 7 Aug 97; Memorandum for Mel Hunt, WIDD, USAFAS, subj: SME Review of Captain Professional Military Education Portion of 1998 Annual Command History, 17 Feb 99, Doc II-54.

Phase four would represent the culmination of the captain career course. Besides integrating Distance Learning, Classroom XXI, and other initiatives into the captain career course, the phase planned for the course to be taught at one location and to employ advanced information technologies to permit interaction between USAFAS instructors and CAS3 instructors.[60]

In 1997 TRADOC solidified its plans for phases three and four. As announced in August 1997, phase three would consist of three parts and begin in FY 1999 (1 October 1998). After making a permanent change of station (PCS) to a branch school, captains would undergo two weeks of common core instruction during part one. Branch tactical, technical, and warfighting instruction would follow in part two at the branch school. Together, parts one and two meant spending approximately eighteen weeks at the branch school. For part three the officers would move in a temporary duty (TDY) status enroute to a new assignment or TDY return status to the branch school for staff process training at CAS3 at Fort Leavenworth for six weeks. In phase four that was scheduled to begin in FY 2002, captains would attend a Consolidated Captains Career Course at a branch school. The course would be broken down into three parts. Part one would last two weeks and provide common core instruction, while part two would take sixteen weeks and furnish branch technical, tactical, and warfighting skills. Using distance learning technology, part three would be beamed from Fort Leavenworth to the branch schools, would last six weeks, and cover staff processes.[61]

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[60]1997 USAFACFS ACH, p. 32.

[61]Ibid., pp. 32-33.

Implementing phases two and three involved hard work in 1997 for the Field Artillery School. To meet a major phase two objective, the School synchronized OAC course completion dates with the six-week CAS3 start dates. The first OAC to flow into CAS3 graduated on 2 April 1997 and started CAS3 Class 97-4 on 9 April 1997. Meanwhile, the School pushed phase-three objectives to meet the implementation date of 1 October 1998. During the course of 1997, it identified the redundancies between the OAC program of instruction and the CAS3 program of instruction for elimination early in 1998, redesigned its POI as Total Army Training System Courseware, and continued Classroom XXI modernization. At the same time the School reduced OAC from twenty to eighteen weeks by eliminating the staff ride, live-fire exercises, and associated pre-command inspections, by making the diagnostic examination a take-home test, by spending less time on manual gunnery, and by reducing the amount of time to administer examinations, among other things. Under the eighteen-week format, students received large group instruction during the first eight weeks of the course and small group instruction during the last ten weeks. In the large group portion students underwent gunnery training and had Multiple-Launch Rocket System, M109A6 155-mm. self-propelled howitzer, maintenance, and supply accountability classes from the Gunnery Department. Initial Fire Support Automated System (IFSAS) instruction followed. When Advanced Field Artillery Tactical Data System (AFATDS) training, which was scheduled to begin late in 1999, began, it would be given at the same time as IFSAS training. The students would take either IFSAS or AFATDS training depending upon their next assignment. After IFSAS or AFATDS training the students moved into small group instruction under the direction of the Fire Support and Combined Arms Operation Department. Small group training was divided into six blocks of instruction: fundamentals, fire support, field artillery, joint applications, battery command, and Capstone, which was week-long exercise. At the end of 1997 and into early 1998, the School awaited the common core training support packages from TRADOC to complement the already-completed branch specific training. Without receiving the packages by February 1998, the School explained to TRADOC that meeting the 1 October 1998 start date for phase three would be impossible.[62]

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[62]Ibid., p. 33; Briefing, subj: CPT PME FA Captains Career Course, Dec 98, Doc II-55; Briefing, subj: FA Officer Training and Education, Jan 99, Doc II-55A; Briefing, subj: CPT PME General Officer Steering Committee, 30 Jan 98, Doc II-56; Briefing, subj: FA Office Training and Education (CG TRADOC Briefing), Jan 99, Doc II-57; Memorandum for See Distribution with Encl, subj: CPT PME Action Plan, 7 Aug 97; Memorandum for Mel Hunt, WIDD,

USAFAS, subj: SME Review of Captain Professional Military Education Portion of 1998 Annual Command History, 17 Feb 99.

At the recommendation of a council of colonels held in November 1997, TRADOC decided to distribute common core training support packages in three phases to permit earlier integration into Captain Career Course (CCC) programs of instruction and to permit meeting the 1 October 1998 start date for phase three of the transition. Upon receiving phase one common core training support packages from TRADOC in June 1998, the Field Artillery School integrated them into its program of instruction and implemented them with OAC 1-99 that started on 15 November 1998. Phase two training support packages arrived at the Field Artillery School in September 1998 and were incorporated into the program of instruction beginning with OAC 2-99 that was scheduled to start on 19 January 1999. Phase three common core training support packages would follow in the near future because TRADOC was waiting for late doctrinal changes coming from the Army Warfighting Experiments to be incorporated.[63]

Before phase three training support packages could be delivered, however, changes in the overall four-phase CPT PME transition program emerged with a key decision being made by the Chief of Staff of the Army, General Dennis J. Reimer. In a visit to the Command and General Staff College on 31 July 1998 General Reimer received a briefing on CPT PME. Besides approving the implementation of phase three, General Reimer pointed out that CPT PME or the Captain Career Course as it was also called should not move into phase four as originally projected. He did not want staff process training in CAS3 being done via distance learning because he did not want to forfeit the "immense benefit of staff group mentoring and interaction between branches that we now have in CAS3."[64] To produce the savings that phase four was intended to achieve, the General wanted TRADOC to examine the possibility of reducing the length of the advanced course. For the Field Artillery School the decision meant stopping work on the original phase four of CPT PME and focusing attention on finding ways to reduce the length of FAOAC if necessary. In the meantime, TRADOC decided that the practice of attending CAS3 TDY enroute or TDY and return would be limited to TDY and return so that critical administrative processing that could only be done at the branch school could be completed expeditiously before the officer moved onto the next assignment.[65]

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[63]Briefing, subj: CPT PME FA Captains Career Course, Dec 98; Fact Sheet, subj: FAOAC Common Core, Jan 99, Doc II-58; Memorandum for Record, subj: Executive Summary of CPT PME Council of Colonels-17 Nov 97 at Fort Leavenworth, 12 Jan 98, Doc II-59; Briefing, subj: CPT PME General Officer Steering Committee, 30 Jan 98, Doc II-60; Memorandum for Record, subj: Executive Summary for CPT PME General Officer Steering Committee VTC-30 Jan 98, 12 Jan 98, Doc II-61.

[64]Memorandum for CG, TRADOC, and DCG, TRADOC, subj: CSA Visit to CAC, 21 Sep 98, Doc II-62.

[65]Memorandum for CG, TRADOC, and DCG, TRADOC, subj:

CSA Visit to CAC, 21 Sep 98; Briefing, subj: CPT PME FA Captains Career Course, Dec 98.

In 1998 the Fire Support and Combined Arms Operations Department (FSCAOD) in the U.S. Army Field Artillery School (USAFAS) added several new and innovative classes to the precommand course for new field artillery battalion and brigade commanders. FSCAOD adopted video teleconferences (VTC) with maneuver brigade and battalion commanders to discuss fire support issues that were pertinent to precommand students and placed a special emphasis on recent combat training center (CTC) performances and expectations that maneuver commanders had for fire support. Additionally, VTCs were started with all the continental United States CTCs. Discussions with these commanders and the CTCs covered command philosophies and tactics, techniques, and procedures. In addition, FSCAOD incorporated a two-phase program to train students on dealing with the media and introduced a health assessment program that gave commanders their own health status and covered other pertinent health issues of interest future commanders.[66]

NEW EQUIPMENT TRAINING

Multiple-Launch Rocket System (MLRS) Training

As early as 1991, the Army's worldwide contingency strategy mandated deploying, fighting, and winning even though the active component (AC) force structure was shrinking. This placed a greater reliance upon the reserve components (RC) -- U.S. Army Reserve (USAR) and U.S. Army National Guard (ARNG) -- to augment the active component than ever before. In view of this situation, the success of 1st Battalion, 158th Field Artillery Regiment (MLRS) of the Oklahoma Army National Guard in Operation Desert Storm in Southwest Asia in 1991 and the need to remove the obsolete 8-inch self-propelled howitzer from the inventory, the Army developed a MLRS transition program. It involved converting Army National Guard field artillery units from the 8-inch self-propelled howitzer to the MLRS.[67]

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[66]Msg, subj: Field Artillery Precommand Course, 2 Mar 99, Doc II-63.

[67]1994 USAFACFS ACH, p. 57; 1995 USAFACFS ACH, p. 69.

Early in the 1990s, the Gunnery Department in the U.S. Army Field Artillery School (USAFAS) designed a four-phase MLRS training strategy to move an Army National Guard battery from individual qualification through battery certification over a period of three years. The strategy permitted sufficient latitude within each phase to tailor the training to the specific requirements of the unit. During phase one, National Guard soldiers underwent common core skill training in communications, map reading, and drivers training at their home station during three to four inactive duty (IDT) weekend drills. Phase one established the foundation for all future training, had to be completed before the soldiers went to Fort Sill for Military Occupational Skill (MOS) training by New Equipment Training Detachment (NETD) instructors, and used Fort Sill's Televised Network Training (TNET) to conduct a portion of the training via distance learning at home station in 1997 and 1998. During phase two, soldiers attended MOS 13M (MLRS Crewman) and MOS 13P (MLRS Fire Direction Specialist) course training, while leaders attended a two-week MLRS Cadre course. The Gunnery Department designed phase two to be conducted at Fort Sill or the home station by NETD instructors during the National Guard's two-week annual training time with the exception of MOS 13P, which lasted three weeks. The phase was normally conducted during the first summer that a unit converted to MLRS. Upon completion of the courses, the soldiers received their new MOSs.[68]

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[68]1997 USAFACFS ACH, pp. 35-36; Memorandum for AC, USAFAS, subj: MLRS New Equipment Training Overview, Summer 98, 21 Sep 98, Doc II-64; Briefing, subj: MLRS 3x6 New Equipment Training Concept, Nov 98, Doc II-65; "Ft. Sill Soldiers Train Guard," MLRS Dispatch, 3rd Quarter 1998, p. 3, Doc II-66; CPT Lawrence T. Hall, Jr., and CPT Michael A. Sharp, "MLRS NET for the ARNG," Field Artillery, Mar-Apr 96, pp. 44-45, Doc II-67; Memorandum for Record, subj: SME

The next two phases entailed collective training. Phase three consisted of section- and platoon--level training during two years of weekend drills and annual training at a local training area or a nearby army post and was conducted during the second annual training period. Held during the third annual training period, phase four or the final phase provided battery-level training and certification.[69]

Comments on MLRS NET, 24 Feb 99, Doc II-68.

[69]1996 USAFACFS ACH, p. 62; 1997 USAFACFS ACH, p. 36; Memorandum for AC, USAFAS, subj: MLRS New Equipment Training Overview, Summer 98, 21 Sep 98.

Using the four-phase transition program, the Gunnery Department trained six National Guard battalions since the transitions had begun early in the 1990s. Unlike other NETDs that had trained battalions from Oklahoma, Tennessee, Michigan, and Kentucky and were composed of entirely AC personnel, the one that trained with the 3-116th Field Artillery of the Florida Army National Guard in 1997 and 1998 consisted of AC and Army National Guard personnel with the express purpose of getting the latter qualified to be instructors in MLRS courses.[70] The 3-116th Field Artillery completed phase four training in the summer of 1998 with battery-level certification conducted by the 1st MLRS Battalion, 4th Cavalry Brigade of Fort Stewart, Georgia.[71]

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[70]Unfortunately, of the four National Guard personnel employed to help train the Florida unit, a captain moved onto a new position, while a sergeant became a state recruiter. See Memorandum for Record, subj: SME Comments on MLRS NET, 24 Feb 99.

[71]1997 USAFACFS ACH, pp. 36-37; Memorandum for AC, USAFAS, subj: MLRS New Equipment Training Overview, Summer

Meanwhile in cooperation with the Gunnery Department, the 1-142nd Field Artillery of the Arkansas Army National Guard conducted an alternative NET plan to expedite training because of an accelerated fielding schedule that would have the unit's launchers fielded by 1997. Although the Gunnery Department dispatched NETD instructors on temporary duty to Fort Chaffee, Arkansas, on weekends and during annual training periods to train 1-142nd Field Artillery instructors during phase three in 1997, the department did not provide a dedicated New Equipment Training Detachment to the Arkansas unit. The Florida new equipment training detachment supported the conversion training during summer annual training in 1998. Although the Department had to rely upon internal personnel resources because budget restraints prevented TRADOC from providing them as it had done in the past, the alternative plan accomplished its goal. At the end of Fiscal Year 1998, the Arkansas unit was on the same training timeline as the units from Kansas and South Carolina and had received eighteen launchers. All three National Guard units were scheduled to complete training and certification in Fiscal Year 1999 with South Dakota to be finished in Fiscal Year 2000.[72]

98, 21 Sep 98. Of the four National Guard personnel employed to help train the Florida unit, one officer moved onto a new job, while a sergeant became a state recruiter. See Memorandum for Record, subj: SME Comments on MLRS NET, 24 Feb 99.

[72]1997 USAFACFS ACH, pp. 36-37; Memorandum for AC, USAFAS, subj: MLRS New Equipment Training Overview, Summer 98, 21 Sep 98; Briefing, subj: MLRS 3x6 New Equipment Training Concept, Nov 98.

Looking into the near future, the Gunnery Department knew that equipment and funding resources would require revamping MLRS conversion training. At the direction of the Assistant Commandant of the Field Artillery School, the department outlined a new MLRS three-phase conversion training plan of two years in November 1998. Phase one would be conducted by distance learning using computers, CD ROM, video teletraining, or the Internet over a period of one year and would produce MOS qualification. Phase two would be conducted by NETD instructors, while phase three would provide platoon training employing NETD instructors. Battery training and certification, formerly phase four, would be the responsibility of the unit. However, other Army National Guard units, an Army National Guard training support battalion, and mobile training teams from the Gunnery Department would provide assistance as available.[73]

To satisfy the new training plan the Gunnery Department outlined two options. The first option basically preserved the status quo and depended upon three eight-person, all-military teams to conduct the training during phases two and three. While the second option retained the eight-person team for phases two and three, it still provided a significant departure from the past. It outlined using two noncommissioned officers and six contractors, whereas previous teams consisted solely of military personnel. Although the costs for each option were basically the same over a six-year period of Fiscal Years 1999-2005, the second freed up military personnel and reduced personnel turbulence in MLRS units. In a briefing to the Deputy Chief of Staff for Operations for the Army, the Chief of the Fire Support Division in the Gunnery Department recommended selecting option two based upon the Assistant Commandant's guidance because it would save personnel and reduce personnel turbulence. In view of this, the Deputy Chief of Staff for Operations approved option two for implementation because the Army could not afford to continue taking eight to ten people from a unit when unit manning was in trouble. Funding contractors was a small price to pay for unit stability.[74]

Paladin M109A6 Self-propelled 155-mm. Howitzer New Equipment Training

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[73]Briefing, subj: MLRS 3x6 New Equipment Training Concept, Nov 98.

[74]Briefing, subj: MLRS 3x6 New Equipment Training Concept, Nov 98; Msg, MAJ Hugo Fischer, GD, to Dr. Boyd L. Dastrup, Command Historian, subj: 98 Historical Info Request, 15 Jan 99, Doc II-69.

Beginning in 1993, the Paladin Division, Gunnery Department, U.S. Army Field Artillery School (USAFAS) initiated new equipment training (NET) for the Paladin that was being introduced into the inventory to replace the M109A2/A3/A5 155-mm. self-propelled howitzer. In 1993-94 the Paladin New Equipment Training Team provided maintenance and operator new equipment training to units at Fort Sill, Fort Stewart, and Fort Benning. In 1995 the new equipment training team trained the 3rd Armored Cavalry Regiment (ACR) at Fort Bliss, Texas; the 1-3rd Field Artillery (redesignated 4-2), 2nd Armored Division (redesignated 4th Infantry Division), Fort Hood, Texas; and observer controllers at the National Training Center, Fort Irwin, California. However, the drawdown and budget reduction had a significant influence upon the training. In previous years a new equipment training team had fifty-four people for maintenance and operator training, trained the entire battalion during a period of four weeks, and had the ability to field a battalion of twenty-four howitzers at a time. After arriving on site, the team, led by a lieutenant colonel, divided into three battery teams, one maintenance team, and one headquarters team to train individual and unit skills.[75]

Although this training strategy worked well, the drawdown and budget cuts of 1995 forced the team's size to be reduced from fifty-four to twenty-six, and this changed the instructor-student ratio from one to three to one to six. In view of this personnel cut, the Gunnery Department had to revamp its training plan by devising a six-week training schedule. Rather than training an entire battalion at

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[75]"New Equipment Training for Paladin--The Future Is Now!" Field Artillery, Feb 93, pp. 51-53, Doc II-70; LTC Sidney E. Riley, "Paladin NET Lessons for Those Who Follow," Field Artillery, Apr 94, pp. 15-17, Doc II-71; Staff Directory (Extract), 15 Jun 93, p. 5, Doc II-72.

one time, the team conducted organizational and direct support maintenance training for the mechanics during the first two weeks. In October 1995 the Department turned maintenance training over to the contractor when the 1-3rd Field Artillery (reflagged 4-42nd since) at Fort Hood, Texas, began new equipment training. In the third week the team provided operator training for the leaders; and in the fourth week they trained the operators. During the last two weeks of training, the NET team conducted collective training and concluded it with intensive battery field exercises and battery and battalion dry- and live-fire exercises. This new training strategy essentially provided a two-phase new equipment training program for the Paladin by the end of 1995. While the contractor furnished two weeks of maintenance new equipment training, the Gunnery Department supplied four weeks of operator new equipment training. Judged by the Chief of the Paladin New Equipment Training team, the new arrangement worked well and provided solid maintenance and operator training.[76]

[76]1996 USAFACFS ACH, pp. 64-65; Msg, subj: Paladin NET-Reply, 27 Jan 99, Doc II-73; Fact Sheet, subj: Paladin Fieldings, 29 May 98, Doc II-74; Interview, Dastrup with MAJ Jeffrey A. Taylor, Chief, Paladin Division, GD, 16 Feb 96, Doc II-75; Memorandum for Cdr, 4/42 FA, subj: Final Report on Paladin NET Team Fielding, 10 Jan 96, Doc II-76; Interview, Dastrup with MAJ Hall, Paladin Division, GD, 15 Jan 97, Doc II-77.

In the midst of training the active component in 1996-97 with the two-phase program, the Army recognized that training the National Guard would be difficult and require additional personnel and turned to the National Guard Bureau for assistance.[77] To facilitate National Guard fieldings that would begin in 1997 just as active component unit fieldings were being completed and continue through 2001, the National Guard Bureau announced the creation of thirty Title 10 Active Guard Reserve (AGR) positions for the M109A6 Paladin NET team on 15 August 1996. The Bureau wanted three officers and twenty-six noncommissioned officers to serve as instructor-writers and to become subject matter experts, who could be used by their respective states after their tour on the NET team had been completed. Once on board early in 1997, the National Guard NET team gave the Field Artillery School a second NET team. In keeping with the Total Force concept, the Field Artillery School integrated National Guard personnel with active component people beginning on 1 January 1998. By February 1998 two trained Paladin NET teams existed. Both were composed of National Guard and active component personnel with no distinction being made between the two components.[78]

In 1998 fielding efforts continued. During the year, the Gunnery Department's two NET teams finished fielding the Paladin to the active component employing the two-phase training program composed of contractor-furnished maintenance new equipment training and Gunnery Department-provided operator new equipment training. The Gunnery Department completed training active component field artillery units in Germany, Fort Riley, Kansas, and Fort Lewis, Washington.[79]

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[77]1997 USAFACFS ACH, p. 38; Fact Sheet, subj: Paladin Fieldings, 29 May 98; Memorandum for Cdr, 2-82nd FA, subj: Paladin NET Final Report, 14 Aug 96, Doc II-78.

[78]1997 USAFACFS ACH, pp. 38-39; Memorandum for Operations, GD, subj: Bi-weekly SIGACTS, 11 Feb 98, Doc II-79; Memorandum for Operations, GD, subj: Bi-weekly SIGACTS, 2 Dec 97, Doc II-80.

[79]Briefing, subj: Paladin NET Overview, 1998, Doc II-81; Interview, Dastrup with LTC William P. Troy, Chief, Paladin Division, GD, 26 Jan 99, Doc II-82; Memorandum for

Cdr, 1/37 FA, subj: Paladin NET Final Report, 3 Dec 97, Doc II-83; Memorandum for Cdr, 1/6 FA, and Cdr, 1/7 FA, subj: Paladin NET Final Report, 12 May 98, Doc II-84; Memorandum for Cdr, 2/3 FA, subj: Paladin NET Final Report, 3 Aug 98, Doc II-85; Memorandum for Cdr, 1/5 FA, subj: Paladin NET Final Report, 10 Oct 98, Doc II-86; Memorandum for Cdr, 4/1 FA, subj: Paladin NET Final Report, 20 Nov 98, Doc II-87; Memorandum for Cdr, 1/127 FA, KSARNG, subj: Paladin NET Final Report, 30 Jun 98, Doc II-88; Memorandum for Cdr, 1/214 FA, GAARNG, subj: Paladin NET Final Report, 1 Aug 98, Doc II-89; Fact Sheet, subj: Paladin Fieldings, 29 May 98.

Fieldings with the National Guard field artillery battalions in 1997-98, meanwhile, illustrated the challenges training such types of units using the existing two-phase plan. Because National Guard personnel were not available on a continuous basis as their counterparts in active component units, the Gunnery Department revised its two-phase training program of four weeks. In cooperation with the Paladin Program Manager, the Paladin Division in the Gunnery Department designed a three-phase training program in 1997 to train a unit over a period of one year. Concurrent with contractor-furnished maintenance new equipment training, Gunnery Department new equipment training teams furnished operator new equipment training in three phases. During phase one, unit leaders went through an eighty-hour Paladin Cadre Course at Fort Sill. Phase-two training took place during the unit's weekend training drills at home station and lasted ten months. Phase-three training occurred during a three-week annual training period (two weeks is the norm) and culminated with live-fire exercises to qualify the newly-equipped units with the required skills to employ the Paladin properly. In 1997-98 the new equipment training teams completed all three phases of training with the 1-127th Field Artillery of the Kansas Army National Guard, the 1-214th Field Artillery of the Georgia National Guard, and the 1-114th Field Artillery of the Mississippi Army National Guard and began phase one training with units from Utah, New Mexico, Wisconsin, South Carolina, and West Virginia in mid-1998.[80]

[80]Memorandum with Encl for Dir, GD, et al, subj: Paladin New Equipment Training, 14 Dec 98, Doc II-90; Briefing, subj: Paladin NET Overview, 1998; Msg, subj: Paladin NET-Reply, 27 Jan 99; Memorandum for Record, subj: Annual History Input, 23 Feb 99, Doc II-91.

In the meantime, the Gunnery Department reviewed its new equipment training strategy early in 1998 because the U.S. Army extended Paladin fieldings into Fiscal Year (FY) 2001. This action by the U.S. Army created a problem. As of March 1998, existing active component personnel dedicated to new equipment training were programmed to continue through FY 2000. Given the personnel programming, extending the fielding of the Paladin would create a personnel shortage and degrade training at the same time because the current new equipment training strategy, based upon two complete teams, provided the minimal required level of training. To provide the necessary training the Gunnery Department furnished the Assistant Commandant of the Field Artillery School with five courses of action. Of the five that ranged from extending both active component and Active Guard Reserve new equipment training teams to providing contractor maintenance and operator new equipment training, the Department recommended extending both active component and Active Guard Reserve new equipment teams through FY 2001 because it would preserve the existing fielding strategy and allow for more flexibility than the others did to adapt to potential changes in the fielding schedule, even though it required U.S. Army Training and Doctrine Command and National Guard Bureau approval. The Assistant Commandant concurred with the recommendation. TRADOC approval came on 13 July 1998, and the Director of the National Guard Bureau, Major General Roger C. Schultz, approved on 9 November 1998.[81]

FIRE SUPPORT COMBINED ARMS TACTICAL TRAINER

The Fire Support Combined Arms Tactical Trainer (FSCATT) originated as the Closed Loop Artillery Simulation System (CLASS) in 1990-91. Taking advantage of advanced technology, the U.S. Army Field Artillery (USAFAS) sought to introduce CLASS as the cornerstone of its Fire Support Training Strategy (FSTS), which was a portion of the U.S. Army's Combined Arms Training Strategy (CATS), to improve training and reduce optempo (fuel and ammunition) expenditures in the face of declining budgets.[82]

Early in 1990, the USAFAS envisioned that CLASS would be a "system of systems," composed of a forward observer trainer, a fire direction trainer, and a howitzer simulator trainer, and would be issued to Army National Guard and active component (AC) units for sustainment training and the Field Artillery School for institutional training. As planned, CLASS would furnish effective training for the gunnery team in realistic fire missions by integrating its target acquisition, fire direction, and weapon delivery elements. With the

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[81]Interview, Dastrup with Troy, 26 Jan 99; Msg with Encls, subj: Paladin Staff Study, 28 Jan 99, Doc II-92; Msg, subj: Paladin NET-Reply, 1 Feb 99, Doc II-93; Msg, subj: NGB Approval of Extending NET Resources, 1 Feb 99, Doc II-94.

[82]1995 USAFACFS ACH, pp. 73-74.

projection of continued decreases in funding through the rest of the 1990s, however, CLASS could not stand on its merits solely as a field artillery trainer. CLASS had to meet the requirements of a Combined Arms Tactical Trainer (CATT) to survive the budget reductions.[83]

[83]Ibid., p. 74; 1996 USAFACFS ACH, pp. 71-72.

After extensive discussions with the U.S. Army Training and Doctrine Command (TRADOC) and U.S. Army Simulation Training and Instruction Command (STRICOM) during the late months of 1992 and early months of 1993, the Field Artillery School redesignated CLASS as FSCATT and agreed to field it in two phases. Phase one would provide a gunnery team trainer. It would be a platoon-level training device to train the gunnery team to deliver accurate and predicted fires and would have the capability of being linked with CATT via distributive interactive simulation. Evolving from phase one, phase two would consist of a FSCATT that focused on platoon- through battalion-level combined arms training on a simulated, fully interactive, real-time battlefield. It would permit field artillery units and the fire support team to participate in the combined arms virtual battlefield.[84]

As of 1997, FSCATT program consisted of the howitzer crew trainer (HCT), the howitzer strap-on trainer (HSOT), and the collective training control subsystem (CTCS) and used the Guard Unit Armory Device Full-crew Interactive Simulation Trainer-simulator (GUARDFIST II) as the forward observer trainer. The howitzer crew trainer, both the M109A5 and M109A6 variants, realistically aimed, loaded, and fired a full working suite of 155-mm. rounds with the simulated cannon recoiling when fired. Each howitzer crew trainer had an integral instructor-operator station for initiating and controlling training, recording and displaying data, evaluating crew performance, and generating after action reviews. Developed for use primarily with towed howitzers, the howitzer strap-on trainer had an integral instructor-operator station that performed the same functions as its counterpart on the howitzer crew trainer did and had sensors that attached to the actual weapon's fire control instrumentation. The strap-on trainer would supplement the howitzer crew trainer with self-propelled units as required. The collective training control subsystem, in the meantime, would record all pertinent operational data from the GUARDFIST II, the fire direction station, and howitzer firing elements and would furnish after action reports. The collective training control subsystem also tied FSCATT together by performing five major functions: interface with GUARDFIST, stimulation of the unit's fire direction center computer for fire direction center training, control of collective training, ballistic simulation and computation, and consolidation of evaluation data.[85]

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[84]1997 USAFACFS ACH, pp. 41-42. See Memorandum for Assistant Deputy Chief of Staff for Training, subj: FSCATT, 10 Jan 95, Doc II-95, for additional information.

[85]1997 USAFACFS ACH, p. 42; Memorandum for Record, subj: Annual Command History Input, 25 Feb 99, Doc II-96A.

Scheduled for fielding from April 1998 through 2002 with each self-propelled howitzer battalion receiving two howitzer crew trainers and one howitzer strap-on trainer, FSCATT would provide stand-alone, interactive, and closed-loop training. In the stand-alone mode each trainer could be employed independently to train individual tasks and functions. The interactive mode permitted combined howitzer and fire direction center training by matching several howitzer trainer configurations with organic fire direction center computers and the CTCS's fire direction center subsystem. In the close-loop mode the observer's call-for-fire would be transmitted from GUARDFIST to the battery fire direction center with fire commands being sent to the howitzers (the howitzer crew trainer or howitzer strap-on trainer). The data set and fired signal would be sent by the howitzer crew to the GUARDFIST, which would convert them to "did-hit" data. The impact of the "did-hit" data would be displayed on the GUARDFIST for further correction by the observer.[86]

In March 1998 FSCATT underwent customer testing at Fort Sill. The test team consisted of soldiers from the 1st Battalion, 78th Field Artillery, U.S. Army Field Artillery Training Center, the 3rd Battalion, 18th Field Artillery, and 2nd Battalion, 138th Kentucky National Guard. Although USAFAS anticipated great things from the system, FSCATT performed poorly. Technical difficulties caused the system to fail the test. This led to another test in September 1998 to determine if the contractor had made the corrections. The September 1998 test demonstrated that the necessary fixes had been made to the howitzer crew trainer for the M109A5, that the trainer would be valuable, and that it could be fielded as planned. In contrast, the howitzer strap-on trainer failed to meet the operational technical standards and was deleted from the FSCATT program. It was too difficult to set up on a towed howitzer and therefore had a limited training value. This decision meant that any towed artillery application in FSCATT would be absent and that ammunition savings would not be achieved in towed

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[86]1997 USAFACFS ACH, pp. 42-43; "FSCATT: Closed-Loop Training of the FO, FDC, and Howitzer Section," Field Artillery, Jul-Aug 97, pp. 44-45, Doc II-97.

units.[87]

[87]"Artillery Soldiers Test Fire FSCATT," Fort Sill Cannoneer, 23 Apr 98, pp. 1a, 2a, Doc II-98; "New Simulator Helps Train Field Artillery Soldiers," Fort Sill Cannoneer, 29 Oct 98, pp. 1a, 3a, Doc II-99; Fact Sheet, subj: FSCATT, Feb 98, Doc II-100; Fact Sheet, subj: FSCATT, 16 Oct 98, Doc II-101; Fact Sheet, subj: FSCATT, 10 Dec 98, Doc II-102; Interview, Dastrup with Don Kraft, WIDD, 2 Feb 99, Doc II-103; Memorandum for Record, subj: Battle Lab Input to 1998 Annual Command History, 22 Mar 99, Doc II-103A.

Because the Army decided against fielding the howitzer strap-on trainer, the FSCATT consisted of three major components at the end of 1998 -- howitzer crew trainer, the collective training control system with its fire direction subsystem, and GUARDFIST II.[88] The U.S. Army Field Artillery Training Center at Fort Sill received six FSCATTs in the fall of 1998, while the 1-133rd Field Artillery of the Texas National Guard received two. The 1-121st Field Artillery of the Wisconsin National Guard and the 1-86th Field Artillery of the Vermont National Guard received one FSCATT each. This left twenty-eight FSCATTs to be delivered to National Guard battalions during the next two years.[89]

DEVELOPING FIELD ARTILLERY MANUALS

In 1995 two critical developments changed the way that the U.S. Army Field Artillery School (USAFAS) produced field manuals (FM) and mission training plans (MTP) manuals. Early in the 1990s, the School abolished the Doctrine Division, which oversaw the writing of doctrine, and the Individual and Unit Training Division, which wrote training manuals, in the Directorate of Training and Doctrine because of budget reductions. The School subsequently decentralized the writing of doctrinal and training manuals by shifting responsibility to the training departments. For example, the Directorate of Training and Evaluation, which was created by the merger of the Directorate of Evaluation and Standardization and the Directorate of Training and Doctrine in 1993, produced training material, while the Fire Support and

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[88]Fact Sheet, subj: FSCATT, Dec 98, Doc II-104; Interview, Dastrup with Kraft, 2 Feb 99; Fact Sheet, subj: FSCATT, 16 Oct 98.

[89]Msg, subj: FSCATT Fielding Plan, 1 Feb 99, Doc II-105; Fact Sheet, subj: FSCATT, 10 Dec 98; Interview, Dastrup with Kraft, 2 Feb 99; Fact Sheet, subj: FSCATT, Feb 98; Fact Sheet, subj: FSCATT, Dec 98; Memorandum for Record, subj: Annual Command History Input, 25 Feb 99.

Combined Arms Operations Department (FSCAOD) wrote battalion through corps doctrine. However, no organization oversaw the writing process, and the production of manuals fell behind schedule. As a result, many manuals became obsolete by the mid-1990s because they had not been revised since the late 1980s or early 1990s. At the same time the School lost expertise in developing or revising doctrinal and training manuals. Many civilian doctrine developers retired, and some were lost through reductions-in-force. In the meantime, many of the officer and enlisted doctrine developer positions were eliminated. Those remaining with experience in developing doctrinal and training manuals were distributed throughout the School to other positions.[90]

[90]1995 USAFACFS ACH, pp. 81-82.

In view of the situation, the Assistant Commandant of the Field Artillery School, Brigadier General Leo J. Baxter, decided that someone had to oversee the development process and that someone had to write the manuals. To manage the process the School created the Doctrine Division in the Warfighting Integration and Development Directorate (WIDD) in 1995. Other School departments and directorates still participated as reviewers or subject matter experts but not as writers of doctrinal manuals, but WIDD, specifically the Doctrine Branch, managed the process to centralize control. At the same time the School started contracting out the writing of manuals because it was less expensive than hiring civilians and writing them in-house and signed a contract with MPRI, a company that had worked for the School previously on other projects, to write manuals.[91]

During 1996, the School made significant progress publishing manuals as a result of the contracting-out process. Of its three field manuals MPRI completed FM 6-15 (Field Artillery Meteorology) and provided initial drafts for review and comments on FM 6-20-1 (Field Artillery Cannon Battalion) and FM 6-20-2 (Corps and Division Artillery). In the meantime, the School contracted with TechMasters in 1996 for FM 6-20 (Fire Support) and FM 6-20-30 (Fire Support for Corps and Division).[92]

Although headway was being made to update field manuals and mission training plans, the School encountered a problem with serious ramifications on the production of manuals. Budget cuts in 1996 left the School with insufficient money to print locally and distribute the initial and final drafts of three manuals (FM 6-20-1, FM 6-20-2, and FM 6-20-30) in the quantity that would allow review and comments by the affected field artillery units. Previously, the School would have sent FM 6-20-2 to all corps artilleries, division artilleries, and field artillery brigades in both the active Army and National Guard for review.[93]

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[91]Ibid., pp. 82-83; Memorandum for B. Bielinski, WIDD, USAFAS, subj: SME Review of Developing Field Artillery Manuals Portion of 1998 Annual Command History, 17 Feb 99, Doc II-106.

[92]1997 USAFACFS ACH, p. 44; Memorandum for Director, WIDD, subj: Coordination of 1998 USAFACFS Annual Command History, 15 Mar 99, Doc II-19A.

[93]Ibid.

In view of diminishing funding, the School looked for a less expensive way than coordinating them in hard-copy format. The School examined the possibility of staffing them electronically through the Internet and worked with its own Information Management Office and the Directorate of Plans, Training, and Mobilization at Fort Sill to make it happen. However, security raised concerns. Passwords would have to be given out to restrict access to only those authorized to read the manuals. Given this, the School had not decided on a method of staffing as 1996 drew to a close, even though the U.S. Army Training and Doctrine Command (TRADOC) in 1996 established the requirement for electronic staffing of manuals to only authorized personnel.[94]

Early in 1997, the question of electronically staffing manuals arose at a TRADOC Semi-Annual Doctrine Conference because other TRADOC service schools were having the same problems with passwords as the Field Artillery School was. There, however, was a notable exception. Fort Leavenworth had already begun posting draft manuals on its homepage without requiring a user identification or pass word. In response to Fort Leavenworth's success and the problems with passwords, TRADOC said that a manual could be placed on a homepage without requiring a password or user identification in order to be read unless the manual had a restricted distribution. TRADOC also said that draft manuals on the Internet should have a warning statement that it was a draft and not approved Army doctrine until it was formally accepted and signed.[95]

Meanwhile, more budget cuts forced the Field Artillery School to cease the contracting out of manuals in 1997. Before this occurred, however, TechMasters completed an initial draft of FM 6-20-30 and a final draft of FM 6-20, while MPRI produced a final draft of FM 6-20-1 and a final draft of FM 6-20-2. Given TRADOC guidance, the Field Artillery School placed all of them on Fort Sill's home page on the World Wide Web for review and comments.[96]

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[94] Ibid.

[95] Ibid., pp. 44-45.

[96] Ibid., p. 45.

In 1998 fighting for funding to publish manuals persisted. Knowing that getting the completed manuals to field was critical, WIDD obtained end-of-year money to hire contractors to publish FM 6-70 (TTP for M109A6 Paladin Howitzer Operations) and FM 6-20-30 (TTP for Fire Support for Corps and Division Operations). FM 6-20-30 was renamed TTP for Fire Support for Division Operations in November 1998 following a decision by the Commandant of the U.S. Army Field Artillery School that corps and division operations should be treated separately in different manuals. End-of-year funding would also be used to publish XST-6-60 (TTP for MLRS Operations/Command and Attack Battalion), which was retitled Division MLRS Battalion. The acronym CAB for the Command and Attack Battalion created confusion when assigning tasks because it was also the acronym for corps combat aviation brigade. As a result, the Field Artillery School renamed the CAB the Division MLRS battalion. As of the end of 1998, the Field Artillery School planned to revise or develop eleven field manuals in 1999-2000 with ten of them under contract and one to be written by the Doctrine Division of the Warfighting Integration and Development Directorate.[97]

Of the field manuals, completing FM 6-20 proved to be the most challenging. In 1996-97 Joint Publication 3-09 (Doctrine for Joint Fire Support) generated interservice debates over definitions and other critical issues. In the meantime, the U.S. Army Command and General Staff College at Fort Leavenworth, Kansas, rewrote FM 100-5 (Operations) and introduced new ideas and terms in the manual. Together, Joint Publication 3-09 and the Command and General Staff College effort caused work on FM 6-20 to stop in 1997. Writers in the Field Artillery School had to wait for the other publications to be completed before continuing with FM 6-20 because the Field Artillery manual had to be in line with the thinking of the other two. In fact, the School did not plan to begin work again on FM 6-20 until 1998 because the draft of FM 100-5 would not be finished until February 1998.[98]

Efforts with writing FM 6-20 met with mixed results in 1998. In May 1998 the Joint Chiefs of Staff officially approved JCS Publication 3-09. Meanwhile, written by the School for Advanced Military Studies at Fort Leavenworth, a final draft of FM 100-5 was completed in August 1997. Yet, debates over terms and content of FM 100-5 continued in 1998 to prevent Department of the Army approval. Because FM 6-20 was dependent upon FM 100-5, the Field Artillery School had to wait for further writing until the latter would be

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[97]Interview, Dastrup with B. Bielinski, Doctrine Division, WIDD, 20 Jan 99, Doc II-107; Memorandum for Record, subj: Doctrinal Manual Update, 20 Jan 99, Doc II-108; Memorandum for Commandant, USAFAS, subj: Development of Doctrinal Publications, 8 Dec 98, Doc II-109; Memorandum for Cmdt, USAFAS, subj: Renaming the Command and Attack Battalion, 20 Oct 98, Doc II-110; Memorandum for Director, WIDD, subj: Coordination of 1998 USAFACFS Annual Command History, 15 Mar 99.

[98]Memorandum for Cmdt, USAFAS, subj: Renaming the Command and Attack Battalion, 20 Oct 98.

completed in 1999.[99]

[99]Interview, Dastrup with B. Bielinski, Doctrine Division, WIDD, 20 Jan 99.

Concurrently, the U.S. Marine Corps asked the Field Artillery School to dual-designate field artillery manuals. In the past the Marine Corps had used Army manuals, in this case, field artillery manuals. In doing so, the Marine Corps tacitly recognized the Army field manuals as doctrine. In 1996 this changed. The Corps wanted to participate in the writing process to ensure that the manuals would satisfy their needs.[100]

In 1997 the Army and Marine Corps solidified the dual-designation process. Initially, the Army approved the manual after it had been written by Army and Marine writers and sent it to the U.S. Marine Corps Combat Development Command, Quantico, Virginia, to receive a Marine Corps numerical designation. Thus, each manual in the dual-designation system had two numbers. One was an Army number, and the other was a Marine Corps one. During the year, however, the Marine Corps Combat Development Command transferred proponency for fire support publications to the Marine Corps Detachment at Fort Sill but never staffed or funded the additional work. Nevertheless, the Detachment gave WIDD one officer to write and coordinate Marine Corps publications with the Army and to review Army publications.[101]

Although the dual-designation practice continued into 1998, the Marine Corps modified it. During the summer of 1998, the Marine Corps decided to dual-designate only fire support manuals of weapon systems that it employed. Because it did not use self-propelled howitzers and the Multiple-Launch Rocket System, the Marine Corps planned to dual-designate only field manuals for towed field artillery.[102]

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[100]1996 USAFACFS ACH, p. 81.

[101]1997 USAFACFS ACH, pp. 44-45.

[102]Interview, Dastrup with Bielinski, 20 Jan 99.

CHAPTER THREE
COMBAT DEVELOPMENTS:
FORCE DESIGN, EQUIPMENT REQUIREMENTS, AND DOCTRINE

INTRODUCTION

During 1998, the U.S. Army Field Artillery School pursued key initiatives to make the Field Artillery more lethal, deployable, and responsive to meet Force XXI and Army After Next requirements. To provide a more coordinated effort, thee School consolidated force and equipment design under the Deputy Assistant Commandant-Future. At the same time the School developed doctrine, tactics, techniques, and procedures; made significant progress towards introducing new equipment and weapons; and evaluated the U.S. Army's Advanced Warfighting Experiments.

DEPUTY ASSISTANT COMMANDANT-FUTURE

In July 1998 the U.S. Army Field Artillery School created the office of the Deputy Assistant Commandant-Future. The office pulled together the research, development, and resourcing efforts of the Depth and Simultaneous Attack Battle Laboratory, Task Force 2000, and the Directorate of Combat Developments. The Deputy Assistant Commandant-Future integrated all futures work in the near term, out to the Army After Next, and beyond at Fort Sill and more closely aligned Training Command's efforts with Headquarters, U.S. Army Training and Doctrine Command.[1]

MEETING THE FUTURE: THE VISION

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[1]"DAC-Futures Formed at FA School," Field Artillery, Sep-Oct 98, p. 26, Doc III-1; Memorandum for Record, subj: Briefing Slides, 1998, Doc III-2; "New Job Integrates Futures," Fort Sill Cannoneer, 8 Oct 98, pp. 1a, 1d, Doc III-3; Briefing, subj: Mission of DAC-F, 1998, Doc III-4.

In the November-December 1998 issue of Field Artillery, the Commanding General of the U.S. Army Field Artillery Center and Fort Sill, Major General Leo J. Baxter, outlined the Field Artillery's vision for the future. As the General explained, the Field Artillery had to prepare to deliver full spectrum effects from massed area fires to precision strikes to disabling equipment with non-lethal fires. The effects would originate from joint, combined, or any combination and from numerous platforms -- cannons, rocket launchers, unmanned aerial vehicles, Air Force aircraft, and satellites in low-earth orbit, among others. Expounding upon this framework, the Deputy Commanding General for Training, Brigadier General Toney Stricklin, added, "Our vision is a more technologically advanced, potent, and agile Field Artillery force, relying as always on well-trained, dedicated and motivated leaders and soldiers to ensure success" to enable the Army to be dominant across the entire spectrum of conflict.[2]

[2]MG Leo J. Baxter, "Meeting the Future: State of the Field Artillery," Field Artillery, Nov-Dec 98, p. 1, Doc III-5; BG Toney Stricklin, "Fires: The Cutting Edge for the 21st Century," Field Artillery, May-Jun 98, p. 22, Doc III-6.

More specifically, the Field Artillery had to revolutionize fires in order to fight America's future wars. In the past the Field Artillery relied upon huge amounts of munitions to defeat targets and was a platform-based force. It had state-of-the-art howitzers or rocket launchers that shot "conventional, dumb, large amounts of ammunition out onto the battlefield in support of maneuver forces."[3] General Baxter explained that the Field Artillery was in the process of shifting away from a platform-based force to a munitions-based force. To do this the branch had to shift from managing weapon systems to managing fires effect by ensuring that they would be delivered at the right place and right time. Smart and brilliant munitions with increased ranges and lethality would give the Field Artillery precision and terminal effects on the target, making the accuracy of the platform's location less important. At the same time General Baxter envisioned a concept called "effects-based fires."[4] With this concept the ground commander no longer would have to be concerned about the source of supporting fires. Through an "effects control center" the commander would simply describe the effects required, and the control center would deliver them.[5] Tailoring the force to accomplish a particular result would accompany moving from a platform-based force to munitions-based force. In the past the Field Artillery positioned firing platforms close to supported maneuver units and used special command and support relationships to control fires centrally. Rather than this, the force had to be based on the effects needed to accomplish the mission before deployment or at a staging base by being more flexible. As the Field Artillery developed new systems with advanced technologies, it had to review at its functions and examine the implications of the new systems on tactics, doctrine, organization, training, and soldier and leader development.[6]

CHANGE IN NONCOMMISSIONED OFFICER STRUCTURE

Over the last ten years the percentage of noncommissioned officers (NCO) in the enlisted force structure in the active Army steadily increased, according to a study completed by the Department of Army in April 1996. In 1989 approximately forty-seven percent of the enlisted force structure consisted of noncommissioned officers. As of late 1995 and early 1996, noncommissioned officers composed about fifty percent of the enlisted personnel. Most likely caused by the turbulence from the drawdown in the force structure since 1989, the expansion in the tables of distribution and allowance (TDA) army, and the reductions in the tables of equipment (TOE) army, the growth increased military personnel costs. At the same time it created grade imbalances in many of the Army's military occupation specialties (MOS), meaning too many authorizations in one grade and too few in another. The imbalance restricted promotion opportunities in some

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[3]"Futurists in the Field," Missiles, Munitions, and Armor, 2(1999): 18, Doc III-7.

[4]Ibid., p. 19.

[5]Ibid.

[6]Baxter, "Meeting the Future," pp. 1-2; Stricklin, "Fires," pp. 22-27.

MOSs, causing career progression to stagnate.[7]

At the same time the study recommended that noncommissioned officers should compose forty-seven percent of the enlisted force for a decrease of three percent. This would support end-strength requirements and costs and would maximize promotion potential and stability across the MOSs. As the study indicated, forty-seven percent was an average across all the MOSs with some having a higher or lower percentage of noncommissioned officers depending upon their respective grade structure.[8]

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[7]1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), p. 48; Briefing, subj: CINCOS, 10 Sep 98, Doc III-8.

[8]1997 USAFACFS ACH, p. 49; Briefing, subj: CINCOS, 10 Sep 98.

Based upon the study's findings, the Vice Chief of Staff of the Army, General Ronald H. Griffith, initiated a program to reduce the Army noncommissioned officer content of fifty percent to forty-seven percent by Fiscal Year (FY) 2000. Guidelines established by the Department of Army charged branch proponents to review their MOSs and to restructure them by increasing or decreasing the percent of noncommissioned officers as appropriate. The proponents had to use the U.S. Army Total Personnel Command (PERSCOM) average grade distribution matrix to bring their promotion pyramids closer to the Army model for good career progression. Although each proponent had to examine every MOS within its Career Management Field (CMF), the Department of the Army (DA) and U.S. Army Training and Doctrine Command (TRADOC) exempted certain positions from being reduced in grade because they were mission essential. For example, DA and TRADOC placed drill sergeants, instructors, training developers (E6 and above), combat developers (E6 and above), equal opportunity NCOs, combat training center observers/controllers, Reserve Officer Training Corps (ROTC) instructors, recruiters/station commanders, and active component/reserve component Title XI NCOs on the exemption list.[9]

Although the decision to reduce the percentage of noncommissioned officers was difficult, the Department of the Army explained that it had salutary effects. First, it would maintain the Army's end-strength at 495,000 in FY 2000 and avoid a 20,000 reduction in end-strength by decreasing spending on military personnel. Second, it would correct the imbalances. Third, it would refine the drawdown that had started in 1989.[10]

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[9]1997 USAFACFS ACH, p. 49; Briefing, subj: CINCOS, 10 Sep 98.

[10]1997 USAFACFS ACH, pp. 49-50.

After reviewing all MOSs, seeking recommendations and comments from the field, and applying direction from the Assistant Commandant of the Field Artillery School to ensure viable career progression, the task force created by the Field Artillery Proponency Office (FAPO) in the Field Artillery School systematically reviewed all Field Artillery TDA and TOE positions and Force Design Updates, solicited input from all Field Artillery command sergeant majors, and formulated restructuring proposals in 1996-97. The task force forwarded its proposals through TRADOC early in 1997 to the Chief of Staff of the Army. Approved by the Chief of Staff on 2 July 1997 along with CINCOS's actions from other proponents, the eight proposals improved grade distribution within each MOS in CMF 13 throughout TDA army and TOE army, created MOS 13D (Tactical Data Systems Specialist) by combining MOS 13C (Tactical Automated Fire Control Systems Specialist) and MOS 13P (Fire Direction Specialist) beginning in FY 2000, and improved career progression in nine of ten CMF 13 MOSs. Only MOS 93F (Field Artillery Meteorological Crewmember) remained unaffected. The task force was unable to find a way to restructure 93F positions because of manning and grading levels required to meet equipment configurations. Based upon work by the Field Artillery School and the other proponents, the Department of the Army concluded in June 1998 that reshaping the NCO force was successful.[11]

Disrupting the CINCOS effort, in the meantime, the Department of the Army unexpectedly abandoned the recommendations of May 1998 that were to be applied across the TOE and TDA armies by making its own cuts without consulting the proponents. In order to reduce current operating strength deviations shortfall, the Department of the Army implemented its own plan by deciding to take a total of five thousand NCO spaces from the TDA army and replace them with 10-level soldiers, cut 824 NCOs across 128 MOSs from E5-E9 in TRADOC, expected strict adherence, and permitted little flexibility. As a result of this action, TRADOC told Fort Sill to reduce 120 NCOs from its TDA and to replace them with 10-level soldiers. Upon receiving this information and notification that it would lose ninety-two NCOs in CMF 13

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[11]1997 USAFACFS ACH, p. 50; Msg, subj: CINCOS GOSC (General Officer Steering Committee) Results, 26 Aug 98, Doc III-9; Msg with Atch, subj: TRADOC CINCOS Proposals, 15 Jul 98, Doc III-10; Msg, subj: FY98 Programmed Managed Losses and Change in NCO Structure, 101707Z Jun 98, Doc III-11; Information Paper, subj: CINCOS, undated, Doc III-12; Fact Sheet, subj: CINCOS, Feb 98, Doc III-13.

and twenty-eight NCOs from other CMFs from its TDA, Fort Sill acted. On 27 May 1998 Fort Sill requested the Department of the Army and TRADOC to reconsider the cuts.[12]

For Fort Sill the direction to reduce 120 NCO positions meant a severe disruption in operations. In a memorandum to TRADOC

[12]Msg, FAPO, subj: CINCOS Reductions by MOS and Grade, 17 Aug 98, Doc III-14; Memorandum for Directors of Resource Management and Manpower Officers, subj: NCO Grade Reductions/CINCOS, undated, Doc III-15; Msg with Atch, subj: CINCOS Reductions by MOS and Grade, 17 Aug 98, Doc III-16; Memorandum for Chief of Staff with Encls, Training Command, subj: CINCOS, 10 Aug 98, Doc III-17; Memorandum for CG, subj: CINCOS NCO Grade Reductions--Decision Paper, 2 Sep 98, Doc III-18; Msg, subj: TRADOC CINCOS Proposals, 15 Jul 98; Msg with Atchs, subj: Message for the SMA, CINCOS, 19 Aug 98, Doc III-19; Briefing, subj: TRADOC TDA NCO Reduction, undated, Doc III-20; Briefing, subj: To Obtain CG Approval on 120 NCO Reductions, undated, Doc III-21; Msg, subj: CINCOS GOSC Results, 26 Aug 98, Doc III-22.

on 27 May 1998, the Chief of Staff for Training Command wrote that with the reductions and downgrading we have already taken in both the military and civilian sectors, we found it impossible to meet our mission at the grade levels proposed by the Department of the Army CINCOS guidance. The Chief of Staff related:

> One example of the impact is what happens to our Central Tasking function. With the recommended changes, we will now be authorized one E4 to do work that was formerly done by a GS11, GS07, GS05, and a captain. The captain was replaced with an E7. The E7 was downgraded to an E6, and now the E6 is being downgraded to an E4.[13]

As the Chief of Staff suggested, Department of the Army guidance placed Training Command in a difficult position by forcing it use less qualified personnel to accomplish complicated tasks that had once been completed by higher ranking military and civilian personnel. Along with the budget reductions that had eliminated many civilian positions, CINCOS promised to create more turbulence and make completing Training Command's mission more difficult, even though CINCOS was intended to have a minimal impact upon the essential mission areas. The command had to distribute the 120 cuts across the population of non-exempt positions, and this was disruptive.[14]

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[13]Memorandum for Cdr, TRADOC, subj: CINCOS Re-grading of TDAs, 27 May 98, Doc III-23.

[14]Memorandum for Cdr, TRADOC, subj: CINCOS Re-grading of TDAs, 27 May 98; Msg with Atchs, subj: CINCOS CMF Spread, 17 Aug 98, Doc III-24; Msg, subj: CINCOS NCO Grade Reductions, 16 Aug 98, Doc III-25; Memorandum for PMO, USAFAS, subj: TRADOC Response to Change in NCO Structure, 10 Jul 98, Doc III-26.

As permitted, Fort Sill responded with impact statements about the CINCOS reductions. Addressing the training impact, the adjutant for Training Command at Fort Sill wrote that certain positions could be effectively reduced in grade. In other instances, it would be counterproductive. In 2nd Battalion, 2nd Field Artillery, for example, platoon sergeant, gunnery sergeant, and gunner were critical positions that would significantly create live-fire safety issues if replaced by lower ranking enlisted personnel to meet CINCOS. Many junior enlisted soldiers lacked the experience and maturity to accomplish missions safely that required NCOs. Significant shortages on experience leadership would create career developmental issues for soldiers without leaders that held their MOSs or were very junior in grade. Reductions in CMF 13 NCOs in support positions would degrade training operations by reducing the level of experience. Other leaders at Fort Sill expressed similar concerns about the impact of the reductions upon their respective operations. Non-exempt functions were critical for training and mission support to function effectively, and they were being hit hard with the reductions.[15] A Field Artillery Proponency Office representative related, "Although our war fighting capabilities are not affected, we have hindered our ability to create a viable career progression system. We need to provide each one of our field artillery NCOs a reasonable expectation to get promoted to each skill level without stagnation."[16] Besides efficient operations being at stake, the morale of the NCOs was at stake.[17]

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[15]Memorandum for DRM, subj: CINCOS Increased NCO Reduction Impact Statement, 17 Aug 97, Doc III-27; Msg, subj; CINCOS CMF Spread, 17 Aug 98.

[16]Msg, subj: SMA, CINCOS, 19 Aug 98.

A draft memorandum to be signed by the Commanding General of Fort Sill, Major General Leo J. Baxter, captured the importance of the imposed cuts. In unambiguous terms the General explained:

> We [Fort Sill leadership] assessed the reduction of 120 NCOs for Fort Sill, Oklahoma. The impact to installation leadership, support, safety, accountability, and loss of NCO experience will be significant. It is exacerbated by the 192-position reduction of our civilian workforce currently being implemented as part of the FY 99 budget reduction. It is alarming that we have been targeted for 15 percent of TRADOC's total NCO decrement.[18]

The NCO decrement increased the workload, and continuing decrements would further erode the installation's ability to provide leadership in critical areas. The Gunnery Department in the Field Artillery School even warned that it would have to discontinue certain critical training if it had to rely upon E4s as instructors as a result of the reductions.[19]

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[17] Ibid.

[18] Draft Memorandum for Cdr, TRADOC, subj: Fort Sill CINCOS Reduction by MOS and Grade, 18 Aug 98, Doc III-27A.

[19] Ibid.; Msg with Atchs, subj: CINCOS, 19 Aug 98, Doc III-28; Msg, subj: none, 21 Aug 98, Doc III-29.

Although Fort Sill sought relief through the chain of command, Major General Charles Thomas, the Chief of Staff of TRADOC, indicated that the Army was not flexible on the issue. After promising to carry the installation's concerns to the Department of the Army, General Thomas responded in August 1998, "For CMF 13, HQDA targeted 176 E-6, 254 E-7, and 36 E-9 for a total of 456 net reduction to TDA as they cut and reallocated NCO authorizations. . . . The bottom line is that a heavy cut accrued to Fort Sill primarily because CMF 13 was targeted by HQDA and within the TDA Army. Fort Sill owns the majority of the CMF 13."[20] "However, must honestly tell you that I see little potential for relief given the box that the Army is in," he cautioned.[21] To meet the reductions Fort Sill would have to make hard choices and ultimately take down some of the positions that were considered exempt. Instructor and other exempt positions might have to be sacrificed to save "other positions you view as essential due to safety or other operational concerns," according to General Thomas.[22]

Despite General Thomas's counsel, Fort Sill pushed for relief. In September 1998 General Baxter reaffirmed that the reduction directly affected the installation's ability to accomplish its mission safely, that the reduction would have a negative impact on career progression accessions, and promotions, and that the NCO reductions were the latest in a long series of personnel cuts, which left the post

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[20]Msg, subj; CINCOS, 31 Aug 98, Doc III-30.

[21]Ibid.

[22]Ibid.

incapable of performing "all the work to an acceptable standard."[23] In view of this situation, General Baxter pushed for the reductions to be reconsidered, but as of the end of 1998, the Department of the Army's position had not changed. The cuts would still come.[24]

OFFICER PERSONNEL MANAGEMENT SYSTEM TASK FORCE XXI

[23]Memorandum for Cdr, TRADOC, subj: Fort Sill CINCOS Reductions by MOS and Grade, 8 Sep 98, Doc III-31.

[24]Ibid.; Memorandum for CG with Encls, subj: CINCOS NCO Grade Reductions--Decision Paper, 2 Sep 98; Memorandum for Chief of Staff, Training Command, subj: Change in NCO Structure, 10 Aug 98; Msg, subj: Revised CINCOS Adjustment Guidance, 21 Aug 98, Doc III-32; Msg, subj: CINCO Meeting with VCSA, 21 Aug 98, Doc III-33.

During the last twenty-five years, the Army worked hard to keep its Officer Personnel Management System (OPMS) abreast of the times. Conducted in 1971 and implemented in 1974, OPMS I recommendations centralized the command selection process, designated command tours, created primary and secondary specialties for officers, and abolished the Chemical Corps. Upon being approved in 1984 and implemented in 1985, OPMS II of 1983 established single branch development, functional areas not related to any branch, multiple career tracks, and a revised officer classification system.[25]

Meanwhile, Congress passed the Defense Officer Personnel Management Act (DOPMA) in 1980 after seven years of legislative debate. DOPMA was a rigid system with officer strength caps, grade ceilings, and up-or-out promotion policies. With limited flexibility accorded by DOPMA during downsizing, many officers with hard skills and advanced education were eliminated. The Army failed to promote and retain them as lieutenant colonels or colonels because they frequently lacked command time that was critical for promotion to those grades.[26]

Since DOPMA of 1980 and OPMS II of 1983, profound developments influenced the Army's officer corps. The Defense Reorganization Act (Goldwater-Nichols) of 1986 established joint officer personnel policy and increased joint requirements, while the Defense Acquisition Workforce Improvement Act of 1989 created the Army Acquisition Corps. Subsequently, severe budget constraints of the 1990s forced the Army to be reduced from eighteen to ten divisions and simultaneously decreased the available resources to train, equip, support, and sustain the force. The reductions in the size of the force and amount of resources occurred in the midst of increasing operational demands that strained the Army's ability to respond. At the same time rapid technological advances permitted the Army to evolve towards an information-based organization.[27]

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[25]1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), pp. 50-51.

[26]1997 USAFACFS ACH, p. 51; Briefing, subj: An Officer Corps for the 21st Century, 1998, Doc III-33A. See Maj Lee T. Wyatt III, "DOPMA: Victim of Changing Attitudes," Army, Mar 89, pp. 21-23, Doc III-34, for an interesting discussion on DOPMA.

[27]1997 USAFACFS ACH, p. 51.

Understanding that the changes over the past decade had an impact on officer management, the Chief of Staff of the Army, General Dennis J. Reimer, convened OPMS XXI Task Force in July 1996. He directed the task force to examine current officer management practices and to ensure that they met the needs of the Army and did not hamper warfighting capabilities. As a part of its study that was conducted in 1996 and briefed to the Army Chief of Staff in January 1997, the task force noted that the turbulence in the officer corps caused by the force reductions, among other things, also influenced managing the officer corps. For example, field grade officers rotated in and out of units too frequently during recent years, while the officer inventory could only fill approximately seventy-five percent of the officer authorizations for field grade officers.[28]

To minimize the above problems and to meet the requirements of Army XXI and the Army After Next, the task force outlined significant modifications in managing, developing, and promoting officers. As explained at the briefing to the Chief of Staff of the Army in January 1997, the options ranged from making simple adjustments to the current system to organizing the Army into four career fields.[29]

The latter option, which the Chief of Staff of the Army directed to be implemented, effected field grade officers. While career fields for company grade officer would remain basically the same, those for field grade officers would be grouped by interrelated branches and functional areas into occupation categories. To meet the needs of the operational army, the task force organized the operations career field that would be composed of officers with training, education, and experience in army operations, would have all basic branches, and would be the largest of the four career fields. Recognizing the emergence of advanced information technology and the need to manage it, the task force formed an information operations career field. The task force also organized an institutional support career field to manage, plan, and program army resources, while the operations support career field focused on liaison, procurement, programming, and development specialties.[30]

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[28]1997 USAFACFS ACH, pp. 51-52; OPMS XXI Report (Extract), Jul 97, CSA Guidance, Doc III-35.

[29]1997 USAFACFS ACH, p. 52.

[30]Ibid., p. 52; Memorandum for LTC William Rigby, FAPO, USAFAS, subj: SME Review of OPMS XXI Portion of 1998 Annual Command History, 18 Feb 99, Doc III-36.

The proposed career field program would change the promotion opportunities for all officers by requiring equal DOPMA promotion rates for all career fields. Under the existing career program, a Field Artillery officer had to follow the traditional command path -- attend the U.S. Army Command and General Staff College and serve as an executive officer, an S-3 officer, or brigade fire support officer -- to continue past major. Despite the needs of the Army and desires of the individual officer, the promotion system forced officers to follow a common command path to be promoted. Because the Army required officers with specialized skills, education, and training to compete against command track officers, they faced a distinct disadvantage. Their specialized skills took them away from command time with troops, and promotion boards selected officers with command time for promotion. This situation prompted the OPMS XXI Task Force to devise a new management system. The career field designation and development process would begin upon selection to major. At that time the officer would submit a career field preference statement. It would indicate the desired field in which the officer would like to be managed and developed. The preference statement, the officer evaluation report, and the recommendation of a centralized selection board would determine the officer's career field. Final approval of an officer's career field would be made by the Office of the Chief of Staff of the Army. Although the Field Artillery fell in the operations career field, only about sixty-five percent of Field Artillery majors for a given year group would be placed in the operations career field. The rest would serve in the other three career fields. If, for example, a Field Artillery officer were selected for the operations career field, the individual would serve in an operational unit in a branch-qualifying position, such as an operations officer, executive officer, or brigade fire support officer, and could possibly become a battalion commander. The other thirty-five percent would have repetitive assignments in their designated functional areas and functional integrator positions in their designated career field and become specialists.[31]

Regardless of the career field, every officer would have a reasonable chance for success. Chances for promotion to lieutenant colonel and colonel would be better under the new system than existing one for officers with specialized skills. Officers would compete for promotions only in their designated career field and against only other officers from that career field. However, command positions would be filled by only those in the operations career field.[32]

Implementing the OPMS XXI began on 1 October 1997 and was scheduled to continue through Fiscal Year (FY) 2002. The implementation schedule would provide officers with time to react to the OPMS XXI, permit a smooth transition from the old to the new system, and minimize disruptions in the careers of officers.[33]

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[31]1997 USAFACFS ACH, pp. 52-53; Memorandum for LTC William Rigby, FAPO, USAFAS, subj: SME Review of OPMS XXI Portion of 1998 Annual Command History, 18 Feb 99.

[32]1997 USAFACFS ACH, p. 53.

[33]Ibid.

At the same time OPMS XXI promised to be an improvement over the previous OPMS efforts. As the culmination of thorough research and study, OPMS XXI would enhance the fighting capability of the Army by increasing branch qualification time and reducing officer turbulence for the branches. In addition, OPMS XXI would provide officers with a reasonable opportunity for success by enhancing promotion and command opportunities, would also balance grades and skills at the field grade level, and would comply with DOPMA.[34]

In 1997-98 the Army created ten Officer Development Action Plans (ODAP) to transform OPMS XXI concepts into reality through goals, objectives, and near- and long-term tasks. Seen as a fundamental building block for restructuring the officer corps, ODAP one, entitled Strategic Human Resource Management, had a direct and negative impact upon the Field Artillery and U.S. Army Field Artillery School in 1998 by recoding table of distribution and allowances (TDA) and table of organization and equipment (TOE) grade authorizations.[35] In response to the recoding measure that hit the Field Artillery hard, the Commanding General of the U.S. Army Field Artillery Center and Fort Sill (USAFACFS), Major General Leo J. Baxter, wrote the Commander of the Combined Arms Center (CAC) at Fort Leavenworth, Kansas, in June 1998. General Baxter noted, "OPMS XXI recoding of Field Artillery Colonel positions provides insufficient authorizations to meet the baseline requirements of Field Artillery Colonels."[36] Specifically, the recoding proposed to allot the Field Artillery thirty-eight colonels, whereas

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[34]Ibid.,p. 54.

[35]Briefing, subj: OPMS XXI Recoding, 1997, Doc III-37; Memorandum for Record, subj: Notes from the OPMS XXI Officer Development Update, 19 Nov 98, Doc III-38; Msg with Encl, subj: GOSC Slides #3 of 4, 18 Nov 98, Doc III-39.

[36]Memorandum for Cdr, Combined Arms Center (CAC), Fort Leavenworth, Kansas, subj: Field Artillery Issues for the OPMS XXI ODAP Update to DCSPER, 19 Jun 98, Doc III-40.

the branch needed forty-five colonels at the minimum to meet its TOE and TDA requirements. Specifically, the Field Artillery required thirty for command billets, eight for proponent school director positions, four for Office of the Secretary of Defense/Joint Chiefs of Staff plans officers, and three for field artillery material development positions.[37]

[37]Ibid.

Over the next several months, General Baxter fought to get the forty-five positions authorized. As of August 1998, however, the number remained at thirty-eight with no change in sight. With this in mind and with a sense of urgency, General Baxter pointed out to Brigadier General John R. Wood of the Combined Arms Center at Fort Leavenworth, Kansas, in October 1998 that the Field Artillery would be left with thirty-eight authorized positions for colonels. Most of them were command slots or U.S. Army Training and Doctrine (TRADOC) positions at Fort Sill. Besides leaving critical positions without colonels to fill them, the shortage would create an unbalanced branch pyramid for developmental purposes. This would discourage retention because the chances of reaching colonel and serving in a field artillery position for a captain would be less than a ten percent chance. Although General Baxter and other Field Artillery leaders continued to stress the reasons and need for the forty-five colonel authorizations, the figure of thirty eight prevailed as 1998 drew to a close.[38]

OFFICER RESTRUCTURING INITIATIVE (ORI)

In 1997 the Deputy Chief of Staff for Personnel (DCSPER) in the Department of the Army launched the Officer Restructuring Initiative (ORI) to align total officer requirements or spaces within the inventory allowed by the Defense Officer Personnel Management Act (DOPMA) by Fiscal Year (FY) 2000 and to support the concurrent Officer Personnel Management System XXI effort. As the Field Artillery Proponency Office (FAPO) in the U.S. Army Field Artillery School explained, ORI represented a paradigm shift in distributing officers. In the past mission analysis determined officer spaces without regard to inventory. This often meant that more authorized spaces would exist than could be filled by the inventory. Under ORI guidance requirements would be aligned with the available inventory.[39]

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[38]Msg, subj: OPMS XXI Recoding, 4 Aug 98, Doc III-41; Msg, subj: Field Artillery Colonels and OPMS XXI, 18 Oct 98, Doc III-42; Msg, subj: Confirmation that FA Recoding Concern Warrants Presentation as GO SC Issue, 28 Oct 98, Doc III-43.

[39]Fact Sheet, subj: ORI, 1998, Doc III-44.

Building on reductions outlined by the Quadrennial Defense Review (QDR) and other force structure initiatives, ORI employed the strategy of taking total required cuts (1624) within the Table of Distribution and Allowances (TDA) army and then using Table of Equipment (TOE) army structure changes to realign total officer inventory within the DOPMA grade ceiling. Ultimately, ORI intended to align structure with the allowed inventory. To achieve this the Army developed a two-phase program. Initiated in July 1997, phase one directed a review of TDA structures and documentation of cuts in grade against Fiscal Year (FY) 1999 TDA requirements. It incorporated the QDR cuts of 878 and directed further TDA reductions of 748 to meet the 1,624. Phase two, which began in October 1997, reviewed the TOE army to align required grades within inventory, using grade reduction. This required reducing 508 higher field grade positions to lower ones and changing 1,520 spaces from captain to first lieutenant. As of early 1998, the TOE downgrades for the Field Artillery involved 3 colonels, 13 lieutenant colonels, 19 majors, and 162 captains, making company grade officers the target of the reductions.[40]

From the Field Artillery's perspective, the ORI reduction in grades had a deleterious impact. In a message to the Commander of the Combined Arms Center at Fort Leavenworth, Kansas, Lieutenant General Montgomery Meigs, who wanted input about the ORI impact from the branch chiefs, the Field Artillery Branch Chief, Major General Leo J. Baxter, explained the Field Artillery's position on the ORI reductions. General Baxter wrote on 12 March 1998, "Field Artillery warfighting leader skills are placed at risk. . . . Field Artillery TOEs are currently graded at the minimum wartime requirements. Our review of doctrinal based positions and grades did not support any rolldown [the reduction in the grade authorization for a position] of positions. . . ."[41] General Baxter then added:

> Field Artillery TOE structures represent our minimum warfighting requirements. Previous management actions over the last decade took redundancy out of our units. In a majority of positions we now operate only one deep. Increased automation mitigates this risk, but DAWE [Division Advanced Warfighting Experiment] reinforced the essential need for leader interface and action regardless of level of automation.[42]

In view of this situation, the Field Artillery could not operate effectively by converting colonel authorizations to lieutenant colonel

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[40]Ibid.; Msg, subj: ORI II Reply, 11 Mar 98, Doc III-45.

[41]Msg, subj: ORI Input to CAC, 5 Aug 98, Doc III-46.

[42]Ibid.

authorizations, lieutenant colonel authorizations to major authorizations, major authorizations to captain authorizations, and captain authorizations to first lieutenant authorizations. This could ultimately cause S1, S2, S3, or S4 positions to become first lieutenants, and this was "particularly worrisome" because of the number of captain positions that had been targeted for reduction to first lieutenant positions.[43] Commanders would have to train inexperienced officers but would lack the resources to accomplish the responsibility. Because of the austere manning structures, General Baxter noted, essential staff positions should not be training grounds for entry-level junior officers.[44]

[43] Ibid.

[44] Ibid.

Although other branch chiefs supported General Baxter's position and feared the readiness consequences of the rolldown, the Army proceeded ahead. In April 1998 in the midst of the debate and responses from the branch chiefs about the negative impact of the rolldowns, the Army explained that the ORI would eliminate the need for the authorized level of organization (ALO) and the officer distribution plan (ODP) to manage the difference between the authorizations and the number of officers in the inventory. ORI would reduce the actual discrepancy between authorizations and the distributable inventory.[45]

Based upon input from his branch chiefs during the spring and the summer of 1998, the Commanding General of TRADOC, General William W. Hartzog, opposed implementing the ORI reductions in the TOE army with their focus on captain to first lieutenant authorizations. In view of this position, the Chief of Staff of the Army, General Dennis J. Reimer, did not execute the TOE ORI reductions in 1998 but set in motion the TDA ORI reductions at the field grade level. As a result, Fort Sill had to convert twenty-six major requirements to captain requirements in 1998.[46]

FIELD ARTILLERY INPUT TO DRAFT
DEPARTMENT OF THE ARMY PAMPHLET 600-3

[45]Executive Summary, subj: TRADOC Support of ORI, 23 Apr 98, Doc III-47; Msg, subj: ORI Input to CAC, 5 Aug 98; Msg, subj: ORI II Reply, 11 Mar 98.

[46]Msg, subj: ORI, 5 Feb 99, Doc III-48.

In May 1998 the U.S. Army Field Artillery School (USAFAS) distributed a draft field artillery chapter to Department of the Army (DA) Pamphlet 600-3, Commissioned Officer Development and Career Management, to all senior Field Artillery officers for review before formal DA-level staffing. As the Field Artillery Proponency Office in the School explained, the new DA 600-3 supported the implementation of Officer Personnel Management System (OPMS) XXI. The field artillery chapter, in particular, capitalized on OPMS XXI's intent to provide greater stability and branch qualification time for officers, especially in the grade of major. For branch qualification a major had to serve in a branch qualification position (battalion executive officer or battalion S3 officer) or in a branch qualifying and fire support developmental positions (brigade/regimental fire support officer, division assistant fire support coordinator, brigade/division assistant operations officer) for a minimum of twenty-four months. Experience as a battalion executive officer [XO] and battalion S3 officer would prepare majors for battalion command and enhance their fire support skills. Of the various field artillery positions in the Army, performance as a battalion executive officer or battalion provided the best indication of future success for majors because they gave an officer the maximum experience in leading and managing a battalion.[47]

By identifying battalion executive officer and battalion S3 officer as branch qualifying positions and dropping brigade fire support officer as a branch qualifying position, the School generated a controversy. Colonel James W. Church, the commander of the 2nd Infantry Division Artillery, commented on 21 August 1998, "While I am disappointed in the lack of branch qualifying status for Brigade FSOs [fire support officer], I understand the traditional reluctance in the FA [Field Artillery] community to recognize the worth of this critical assignment."[48] In response, the Assistant Commandant of the Field Artillery School, Brigadier General Lawrence R. Adair, wrote, "We just couldn't find a way to make someone successful in the eyes of a selection board if they had only Bde [brigade] FSO duty -- merely having 600-3 list it as a branch qualifying billet for Majors does not ensure that a board will view that qualification in the same light as an equally proficient Bn [battalion] XO/S3."[49]

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[47]Msg, subj: Draft Field Artillery DA Pam 600-3, 4 Aug 98, Doc III-49; Memorandum for Record, subj: Draft FA Chapter for DA Pam 600-3, Feb 99, Doc III-50.

[48]Msg, subj: Branch Qualification, 2 Sep 98, Doc III-51.

[49]Ibid.

Another criticism about removing the brigade fire support officer from the branch qualification list led to a lengthy reply. A school representative in the Field Artillery Proponency Office noted:

> OPMS XXI ['s] first goal is to increase stability for operation career field officers. . . . FA majors will thus serve 24-36 months in units, and most will now have a follow on FA job . . . once BQ'd [branch qualified]. The requirement for BQ does not specify a minimum time to be S3 or XO [executive officer]. It specifies one of those or a combination [of a branch qualifying position and a developmental position]. . . . We did not write 600-3 to state what board preferences seem to pick, but rather what the collective senior FA [Field Artillery] community saw as the keys to prepare a major for future duty in FA.[50]

[50]Msg, subj: New DA Pam 600-3, 2 Sep 98, Doc III-52.

In short, successful time as a battalion S3 officer or battalion executive officer impressed promotion boards and positively influenced promotions, while success as a fire support officer did not have such an impact. Given the new career system, the School envisioned officers serving in two or more positions as a major, including brigade fire support officer, and be "well situated for command."[51] Over a period of thirty to thirty-six months, a major could serve as a fire support officer, a battalion S3 officer, and a battalion executive officer.[52]

In November 1988 Colonel Robert Reese, another senior field artillery officer, expressed his concern and received an immediate reply. Colonel Reese wrote, "I think we risk losing our ability to demonstrate the importance of the position [brigade fire support officer]" by eliminating it from the branch qualification list.[53] As a reply to the comment, General Adair noted, "This [removing the brigade fire support officer from the branch qualification list] was a VERY hard decision for the CG [Major General Leo J. Baxter of Fort Sill]. . . . It comes down to making an officer most competitive for battalion command."[54] Using a brigade fire support officer as a major branch qualification position simply did not make an officer competitive for battalion command. To the best of the School's knowledge, only one officer, who had served solely as a brigade fire support officer as his major branch qualification position, was selected for battalion command. The new OPMS XXI policy of stability and longer tenure in field artillery units as a major would ensure service as a battalion executive officer or a battalion S3 officer to make the person competitive for promotion and battalion command and would still permit time to serve as a brigade fire support officer.[55]

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[51]Ibid.

[52]Ibid.

[53]Msg, subj: BQ Jobs for Majors, 23 Nov 98, Doc III-53.

[54]Ibid.

[55]Ibid.

In effect, the School determined that a brigade fire support officer was not viewed as being as important as the other two positions throughout the Army because it was unique and because promotion boards failed to promote majors whose sole branch qualifying experience was a brigade fire support officer. In view of these reasons, the School advocated eliminating the position as a branch qualifying and emphasizing battalion executive officers and battalion S3 officers as branch qualifying. As a result, the School dropped brigade fire support officer as a branch qualifying position but added that every officer had to be an executive officer or S3 officer with fire support experience.[56]

THE DEFENSE ADVISORY COMMITTEE ON WOMEN IN THE SERVICES PROPOSAL FOR THE MULTIPLE LAUNCH ROCKET SYSTEM CAREER FIELD TO BE OPEN TO THE ASSIGNMENT OF WOMEN

Beginning in October 1996 and continuing into 1998, the Defense Advisory Committee on Women in the Services (DACOWITS) fought to open Multiple-Launch Rocket System (MLRS) units to women because the system would be employed at great distances from the front and would be out of range of direct combat action and repeatedly demanded the Army for justification on the policy of closing MLRS to women. By taking this position on women, the committee fundamentally disagreed with the Department of Defense Direct Ground Combat Definition and Assignment Rule's collocation exception policy of 1994 that closed MLRS units to women soldiers. Essentially, the policy defined direct ground combat as engaging an enemy on the ground with individual or crew-served weapons, while being exposed to hostile fire and to a high probability of direct physical contact with hostile force's personnel. Direct combat took place well forward on the

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[56]Memorandum for LTC William Rigby, FAPO, USAFAS, subj: SME Review of FA Input to DA Pam 600-3 Portion of 1998 Annual Command History, 18 Feb 99, Doc III-54.

battlefield while locating and closing with the enemy to defeat it by fire, maneuver, or shock effect. Army implementation instructions outlined that infantry, armor, and field artillery battalions met the direct combat definition or one of its exclusion provisions, such as collocation. By collocation the Army meant being placed side by side on the battlefield as a member of a combined arms team, and field artillery cannon and MLRS units could be collocated with the other combat arms on the battlefield in combined arms operations. For the DACOWITS collocation was just another weak rationale for excluding women from MLRS units and pressed to have women admitted to MLRS units.[57]

[57]Memorandum for Cdr, U.S. Army Field Artillery Center and Fort Sill (USAFACFS), subj: Proposal for MLRS Career Field to be Open to the Assignment of Women, 5 Nov 98, Doc III-55; Briefing, subj: Initial CG Brief, 23 Nov 98, Doc III-56; Briefing, subj: CG Update, 7 Dec 98, Doc III-57. Note: DACOWITZ has been trying since 1983 to open MLRS to women. The latest attempt came in 1996 and 1998, Memorandum for LTC William Rigby, FAPO, USAFAS, subj: SME Review of DACOWITS Portion of 1998 Annual Command History, 18 Feb 99, Doc III-58.

On 10 January 1997 the Field Artillery School provided a response to the October 1996 DACOWITS's recommendation and sent it through command channels to the Department of the Army. For unknown reasons the memorandum never reached DACOWITS and sat in the office of the Assistant Secretary of the Army for Manpower and Reserve Affairs for over a year. The failure to receive any response from the Army then caused DACOWITS to react strongly with disappointment at its fall 1998 conference and to approach the Army once again with the recommendation to integrate women into MLRS units.[58]

[58]Msg, subj: DACOWITS, 5 Feb 99, Doc III-59; Briefing, subj: Initial CG Brief, 23 Nov 98; Briefing, subj: CG Update, 7 Dec 98.

Directed by the Deputy Chief of Staff for Personnel at Department of the Army, Lieutenant General David H. Ohle, the U.S. Army Field Artillery School (USAFAS) prepared the Army's response to the DACOWITS recommendation of the fall of 1998. Basically, the General wanted the Field Artillery School to provide a cogent explanation for excluding women from serving in MLRS units in the future. Using the direction furnished by the Commanding General of the U.S. Army Field Artillery Center and Fort Sill and Commandant of the Field Artillery School, Major General Leo J. Baxter, the Field Artillery School prepared a response in December 1998 employing doctrine as a rationale and therefore avoided the equality issue that focused upon a woman's ability to serve in a MLRS unit.[59] In a lengthy memorandum of 10 December 1998 prepared by the Field Artillery Proponency Office in the School, General Baxter explained, "MLRS doctrine has always been to fight forward and place launchers as close to the FLOT [forward line of troops] as possible."[60] The doctrinal manual for MLRS taught that MLRS units fought at close ranges to support the maneuver forces and to engage the enemy at the maximum ranges possible. In Operation Desert Storm of 1991, for example, MLRS units conducted artillery raids across the FLOT before maneuver units advanced and repeatedly intermixed with maneuver units in large ground formations that invited close, direct fire by the enemy. After addressing MLRS and cannon doctrine and other related issues in detail, General Baxter concluded, "MLRS meets the criteria as stated in the Secretary of Defense 1994 Memorandum and the Department of Army implementation instructions. . . ."[61] As a crew-served weapon, MLRS would be exposed to direct hostile fire, would have a high probability of direct ground attack, and would be deployed well forward. In view of current doctrine and after careful consideration, the Department of Army implementation message for the direct ground combat policy that directed that Field Artillery battalions should remain closed to women was appropriate and should not change, according to General

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[59]Memorandum for Cdr, USAFACFS, subj: Proposal for MLRS Career Field to be Open to the Assignment of Women, 5 Nov 98; Msg, subj: DACOWITS, 5 Feb 99; Briefing, subj: Initial CG Brief, 23 Nov 98; Briefing, subj: CG Update, 7 Dec 98; Memorandum for Deputy Chief of Staff for Personnel, subj: DACOWITS Proposal for MLRS Career Field to be Open to the Assignment of Women, 10 Dec 98, Doc III-60.

[60]Ibid.

[61]Ibid.

Baxter.[62]

THE ADVANCED WARFIGHTING EXPERIMENTS

The U.S. Army Field Artillery School created Task Force (TF) 2000 in 1994 to act as the Field Artillery proponent and oversight office for field artillery initiatives and experiments in the Army's Advanced Warfighting Experiments (AWE). As a vital part of the Army's Force XXI effort to design and field the digital force for the twenty-first century, the AWEs allowed the Army to examine innovative approaches to battle command and warfighting, enabled by information-age technologies, using constructive, virtual, and live simulations.[63]

In 1995-97 TF 2000 participated in five AWEs that were part of the Joint Venture campaign, the overall Army effort to move its force into the twenty-first century. From February 1995 to September 1995, the Army conducted Focused Dispatch AWE for heavy forces at Fort Knox, Kentucky. The AWE consisted of a series of constructive and virtual simulations that were followed by a field training exercise with a portion of the forces live and a part portrayed in virtual and constructive simulations. Focused Dispatch examined emerging doctrine, tactics, techniques, and procedures (DTTP) for digitized armored and mechanized infantry forces, including digital linkages of sensors to indirect fire assets to exploit the increased situational awareness that digital systems offered.[64]

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[62]Ibid.

[63]1996 USAFACFS ACH, pp. 94-95.

[64]1995 USAFACFS ACH, pp. 97-98; 1997 USAFACFS ACH, p. 54.

Although tentative observations that digital communications enhanced flexibility for observers and that careful fire support planning was critical when employing sensor-to-shooter links were reached in 1995, firm conclusions emerged in 1996. Focused Dispatch demonstrated the necessity of integrating mortars into the commander's scheme of fires, the requirement for the development of a digitized tactics, techniques, and procedures (TTP) manual for the Army's experimental force, the potential for any sensor to communicate with any fire support node, and the advantages and disadvantages of sensor-to-shooter links. For example, the AWE upheld the absolute need for fire supporters at all levels of command, regardless of the degree of digitization, to clear and integrate fires into the commander's scheme of maneuver.[65]

Shortly afterwards, Task Force 2000 took part in the Warrior Focus AWE at the Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana, in November 1995. A light forces warfighting experiment, Warrior Focus compared the performance of a conventional, non-digitized light task force with a fully digitized light task force. During the AWE, Task Force 2000 examined the employment several digital and advanced fire support systems: the Advanced Field Artillery Tactical Data System (AFATDS), the Advanced Towed Cannon System (ATCAS) prototype (renamed Lightweight 155-mm. Towed Howitzer in 1996 and XM777 in 1997), the M119 towed 105-mm. howitzer with the Gun Laying Positioning System (GLPS) and the surrogate Lightweight Laser Designator-Range Finder (LLDR). The task force intended to gain insights on whether or not there was an increase in the lethality and tempo of fire support to match the capability of a light force operating in a shared-information environment. Lessons revealed that AFATDS effectively supported the operating tempo of light forces, that the digitization of the lightweight 155-mm. towed howitzer would be a good investment, and that the GLPS was a success and a quality replacement for conventional survey.[66]

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[65]1996 USAFACFS ACH, pp. 95-96; 1997 USAFACFS ACH, p. 55.

[66]1996 USAFACFS ACH, p. 97; 1997 USAFACFS ACH, p. 55.

A few months later, the Army conducted the Prairie Warrior/Mobile Strike Force 96 AWE at the U.S. Army Command and General Staff College, Fort Leavenworth, Kansas, in May 1996. Prairie Warrior experimented with a select group of students staffing a division-size unit known as the Mobile Strike Force, which employed advanced battle command concepts, command, control, communications, computers, and intelligence (C4I) systems, and weapon systems anticipated for 2010. Fire support issues examined included AFATDS integration in the division fire support structure and employment of field artillery strike forces. The 1996 Prairie Warrior AWE along with the 1997 Prairie Warrior AWE demonstrated the necessity of preserving the division artillery as the command and control headquarters of the division's fire support assets, the validity of combined arms formations designed to accomplish specific missions with fires (artillery strike force), the requirement for two field artillery brigades to reinforce the fires of a committed division, and the need for a synchronized effort in shaping the battle space at division level.[67]

Building on the AWEs of 1995-96 and using live and constructive simulations in 1996-97 that culminated with a brigade task force rotation at the National Training Center, Fort Irwin, California, the Task Force XXI AWE had a specific objective. The AWE experimented with a modernized brigade combat team of two heavy battalions, one light infantry battalion, and a brigade support slice to demonstrate the potential force effectiveness increases achieved by digitization. The digitization included adding new information-age systems; incorporating new concepts, organizational designs, and employment methods; and developing digitized TTP. Also, the AWE provided information for Force XXI on operational and organizational concepts and materiel acquisition opportunities and assessed the doctrinal, training, leadership, organization, materiel, and soldier impacts of information-age technologies. Ultimately, Task Force XXI AWE intended to help move the Army from an Industrial-Age force to an Information-Age one.[68]

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[67]1996 USAFACFS ACH, pp. 97-98; 1997 USAFACFS ACH, pp. 55-56.

[68]Ibid., p. 56.

Given the desire to develop a digitized force, computer-based appliques formed the centerpiece of the AWE. Designed to provide near-real time situational awareness and to interface with the Field Artillery's AFATDS and the Army Tactical Command and Control System (ATCCS), the appliques furnished near-real time situational awareness and digital command and control at brigade and below. The appliques consisted of computer hardware, installation kits, and systems and application software. The appliques were installed on Task Force XXI AWE weapon platforms and vehicles at brigade and below and deployed with individual dismounted soldiers. Each applique device maintained its own position and transmitted it automatically at regular intervals to other applique devices throughout the brigade. Thus, each applique-equipped vehicle or soldier knew where other similarly equipped vehicles or soldiers were in its battlespace. Experimenting with the appliques, AFATDS, ATCCS, the first-ever tactical Internet, and the other digital communications systems, the AWE hoped to determine their ability to tie army units into one digital information network, to pass information rapidly and efficiently, and to permit planning and executing digitally. For the Field Artillery, any applique-equipped soldier could serve as a digital sensor for indirect fires by interfacing with AFATDS. In the Task Force XXI Final Report, the Commanding General of TRADOC, General William W. Hartzog, provided a summary of the applique's impact by saying that it provided leap ahead capabilities in fighting units in terms of position location.[69]

Although the appliques and ATCCS were the primary information systems of Task Force XXI, the tactical Internet, a concept for connecting the Army's primary tactical communications systems -- the improved single-channel ground and airborne radio system (SINCGARS), enhanced position location reporting system (EPLRS), and mobile subscriber equipment (MSE) -- into a tactical data network, played an equally important role. Basically, the tactical Internet consisted of an EPLRS net for transmitting and receiving digital signals, SINCGARS radio nets for voice and digital communications, and a Surrogate Data Radio (SDR) for data communications. The Internet transmitted digital messages and found the optimal route to the destination. By eliminating the need for electronic line of sight and increasing the range of communications, the tactical Internet had the potential of revolutionizing digital communications as the AWE demonstrated.[70]

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[69] Ibid., p. 57.

[70] Ibid., pp. 57-58.

Meanwhile, Task Force 2000 and the Field Artillery School developed nine initiatives for the Task Force XXI AWE with the objective of employing advanced technology to make fire support more responsive to the needs of the maneuver forces.[71] The heavy forces depended upon the AFATDS and the M109A6 Paladin 155-mm self-propelled howitzer. The two Paladin platoons had a prototype Fire Direction Center (FDC) vehicle, which was a retrofitted M992 with AFATDS, SINCGARS, Applique, and FDC equipment. Fire support for heavy force maneuver units received a boost from the experimental fire support team vehicle, a Bradley fighting vehicle for fire support coordinators at company through battalion levels, while High Mobility Multipurpose Wheeled Vehicle (HMMWV)-mounted Striker teams, formed by reorganizing combat observation and lasing teams (COLTS) into a platoon organization, assisted fire support execution in heavy and light maneuver forces. Two other initiatives, the Firefinder AN/TPQ-36 Version 8 Radar and the AN/TQM-41 Meteorological Measuring System, also enhanced the capability and accuracy of fires. The direct support 105-mm. howitzer battery in the light force had the Lightweight Laser Designator/Rangefinder (LLDR) and Gun Laying Positioning System (GLPS) to improve fires.[72] Shortly after the AWE had been completed, the Field Artillery School provided tentative observations early in 1997 about the nine initiatives. Although all nine enhanced force lethality, survivability, and tempo and showed promise, the Chief of Staff of the Army approved only three of the initiatives for inclusion in the Warfighting Rapid Acquisition Program (WRAP) -- the Striker, the GLPS, and the LLDR.[73] In an article in the November-December 1997 issue of the Field Artillery, the Commanding General of the U.S. Army Field Artillery Center and Fort Sill, Major General Leo J. Baxter, explained, "Striker emerged from the AWE as a clear winner and was accorded the Number 1 position on the WRAP list." The Striker was HMMWV-based combat observation lasing team that gave the maneuver commander an extremely mobile, digitized forward observer team. The AWE demonstrated that the Striker showed great potential in bringing indirect fires onto the enemy early enough to set the conditions for the decisive fight and was virtually invisible to the enemy. A man-portable tripod-mounted gyroscope with an eyesafe laser rangefinder, the GLPS furnished firing batteries, especially light ones, with accurate autonomous positional and directional information and eliminated their dependency upon the battalion for accurate survey. The LLDR supplied man-portable laser designating capability for accurate target location and allowed the observer to locate targets out to ten kilometers to an accuracy of eighty meters and to designate mobile targets at three kilometers and stationary targets out to five kilometers. For light units the LLDR was a "must."[74]

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[71] Ibid., p. 58.

[72] Ibid., p. 58.

[73] Ibid., p. 59.

[74] Ibid.

On a broader scale the Task Force XXI AWE furnished the Field Artillery School a glimpse of the future. After noting that the School was still sifting through the vast expanse of data generated by the AWE, General Baxter pointed out late in 1997, "Successes . . . showed that the fire support system is . . . capable of shaping battlespace and setting the conditions for decisive maneuver." In fact, fires were critical for successful operations by setting the conditions for decisive maneuver by eliminating the enemy's capability to fight in a coherent manner.[75]

[75]Ibid.

Subsequently, Task Force 2000 and the Field Artillery School participated in, observed, and analyzed the Division XXI AWE in November 1997 to validate Force XXI division design and to gain insights to guide digitization. Culminating the AWEs of the past several years and drawing upon the lessons from Task Force XXI AWE, the Division XXI AWE tested a force equipped with information-age battle command capabilities across the battlefield operating systems to determine the technological enhancements in lethality, survivability, and tempo and to validate organization, doctrine, tactics, techniques, and procedures, battle command, and combat service support concepts. Unlike the existing Army of Excellence Division that had seventy-two self-propelled 155-mm. howitzers and nine Multiple-Launch Rocket Systems (MLRS), Division XXI had three howitzer battalions (fifty-four cannons) and one MLRS battalion (eighteen), was reinforced by two field artillery brigades of two MLRS battalions (fifty-four) and one howitzer battalion (eighteen), and incorporated fourteen new major combat systems and an integrated suite of digitized command and control devices, such as the Advanced Field Artillery Tactical Data System.[76]

For the Field Artillery specifically, tentative lessons emerged quickly from the Division XXI AWE and its preceding simulation exercises. On a general note Task Force 2000 and the Field Artillery School learned that situational awareness furnished by digitization allowed the division to cover the battle space of a current corps. Moreover, the division had the ability to shape its battle space through attack helicopters, close air support, and field artillery and set the conditions for decisive operations. At the same time Division AWE fire support initiatives -- Brilliant Antitank and Search and Destroy Armor munitions, Crusader self-propelled 155-mm. howitzer, Firefinder Q-37 Block II radar, and M270A1 MLRS launcher -- provided seamless coverage of the division battle space, while the two field artillery brigades supporting the committed division were essential for rapidly satisfying a wide-range of tasks throughout an expanded battle space. Also, innovative tactics, techniques, and procedures for sensors and automation enabled successful proactive counterfire (killing enemy fire support systems before they fired) and freed assets for the close fight. Ultimately, the emerging lessons from the division AWE showed that fires could pave the way for decisive maneuver by killing armor and that the Advanced Field Artillery Tactical Data System had the potential of enhancing the division's ability to integrate fire support assets and greatly improved the delivery of timely, accurate, and safe fires. Only the final report, which was due to be published sometime in 1998, would provide the conclusive lessons from the Division XXI

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[76]Ibid., p. 60; Report (Extract), subj: DAWE Initial Insights Report, p. 9a, Jan 98, Doc III-61. A corps artillery brigade had two MLRS battalions and one howitzer battalion. Each MLRS battalion had twenty-seven MLRS launchers, and each howitzer battalion had eighteen howitzers.

AWE.[77]

[77]1997 USAFACFS ACH, pp. 60-61; Report (Extract), subj: DAWE Initial Insights, Jan 98, pp. 9a, 22a, 24a, and 39a.

With few exception the final report validated the initial lessons. Coupled with precision weapons and munitions, such as the Extended Range MLRS rocket with a range of forty-five kilometers, Guided MLRS rocket of sixty kilometers, Search and Destroy Armor Munition, and AN/TPQ-36 Version 8 Firefinder radar, information dominance furnished by digitization and enhanced battle command capabilities created a more lethal, survivable, and sustainable force than a non-digitized force and paved the way for decisive defeat of such a force. Specifically, DAWE indirect fire support included divisional artillery of one MLRS battalion of 18 launchers and 3 Crusader battalions of 54 howitzers with ranges up to 50 kilometers and rates of fire of 12 rounds a minute and 2 field artillery brigades of 4 MLRS M270A1 battalions of 108 launchers and 2 Crusader battalions of 36 howitzers for a total of 126 MLRS M270A1 launchers and 90 Crusaders. These indirect fire support assets demonstrated the ability to kill the enemy early and in depth, while the smart munitions frustrated the non-digitized force's ability to mass his artillery and made its large maneuver forces vulnerable to massed fires from the DAWE division.[78]

ARMY EXPERIMENTATION CAMPAIGN PLAN

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[78]Final Report (Extract), subj: DAWE, Jul 98, pp. ES6-ES9, Doc III-62; Memorandum for See Distribution, subj: DAWE Final Report Executive Summary, 4 Nov 98, Doc III-63; COL David P. Valcourt, "Force XXI Victory: More Than Just Gizmos and Digits," Field Artillery, May-Jun 98, pp. 11-16, Doc III-64; COL Bruce A. Brant, "The Counterfire Battle in the DAWE," Field Artillery, May-Jun 98, pp. 28-32, Doc III-65; Fact Sheet, subj: DAWE Insights, Apr 98, Doc III-66; Report, subj: DAWE, Jan 98, Doc III-67.

At a Pentagon presentation in mid-1998, the Commanding General of the U.S. Army Training and Doctrine Command (TRADOC), General William W. Hartzog, unveiled the blueprint of the future Army. Besides announcing the Army XXI heavy division structure upon which the 4th Infantry Division at Fort Hood, Texas, would be organized, equipped, and tested in a few years, General Hartzog said that the Army had developed a three-axis experimental plan to carry the Army beyond Army XXI to the Army After Next of 2025. The light axis would center on the development of new equipment and force structure for light contingency forces. The strike axis would concentrate on experimentation to develop a highly deployable brigade-size force to bridge the lethality and survivability gap between early entry and campaign forces, and finally the mechanized axis would focus on fielding the first digitized division in 2000 and the first digitized corps in 2004.[79]

Understanding that the Division Advanced Warfighting Experiment (DAWE) of 1997 concentrated on the heavy division, the Army knew that it had to modernize its light forces for contingency operations given the world situation. In view of this critical need, the Army decided to look at its light units with the goal of digitizing them and to conduct a Joint Contingency Force Advanced Warfighting Experiment (JCF AWE) in September 2000 at the Joint Readiness Training Center (JRTC), Fort Polk, Louisiana, with the Air Force and Marine Corps. The JCF AWE would examine ways to leverage information technologies, to improve the warfighting capabilities of the light contingency forces, to verify which systems would increase the lethality and survivability of joint contingency forces in an early-entry environment, and to keep United States forces the dominant military land power. In mid-1998 the Army announced that the XVIII Airborne Corps would provide the experimental force for this axis.[80]

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[79]Dennis Steele, "The Army XXI Heavy Division: First Blueprint of the Future Army," Army, Jul 98, pp. 33-35, Doc III-68; Briefing (Extract), subj: Army Experimentation Campaign Plan, 1998, Doc III-69; Annual Report (Extract), subj: Army After Next, 7 Dec 98, p. ii, III-70; Memorandum for LTC Charles Hernandez, TF2000, subj: SME Review of AECP for 1998 Annual Command History, 31 Mar 99, Doc III-70A.

[80]Memorandum for LTC Charles Hernandez, TF2000, subj: SME Review of AECP for 1998 Annual Command History, 31 Mar 99; Memorandum for Data Call Message Addresses, subj: Issue

and Initiative Submission and Review Process, 12 Feb 99, Doc III-71; Msg, subj: Army Experimental Campaign Plan, 29 Sep 98, Doc III-72; Msg, Cdr, TRADOC, to HQ DA, subj: Request for Initiatives to Support Identified Issues in Support of JCF AWE, 0471850Z Feb 99, Doc III-73; Minutes, subj: Army Experimental Campaign Plan, 27-29 Jan 98, Doc III-74; Jason Sherman, "Lighten Up," Armed Forces Journal International, Oct 98, pp. 57-59, Doc III-75; Briefing (Extract), subj: Army Experimental Campaign Plan, 1998, Doc III-76; Briefing, subj: JCF AWE, Mar 99, Doc III-77; Steele, "The Army XXI Heavy Division: First Blueprint of the Future Army," p. 35.

Although TRADOC anticipated that many technologies could transfer easily from the heavy division to the light, it knew that limitations existed. In Force XXI experiments in 1997 the Army equipped every platform from combat service support trucks to attack helicopters with computers that were linked to a tactical internet. With the light forces, that digital link would be taken down to the individual soldier. During the JCF AWE, the Army and TRADOC planned to investigate technologies that would provide digital capabilities, enhance soldier protection, and furnish night vision, especially in urban terrain, for light force soldiers. At the same time, the U.S. Army Field Artillery School intended to continue investigating the High Mobility Artillery Rocket System (HIMARS), the digitized Lightweight 155-mm. howitzer, digitized targeting systems, such as the Lightweight Laser Designator Rangefinder, precision munitions, and other fire support systems to determine their suitability and ability to furnish lethal fire for light forces. Ultimately, the JCF AWE would evaluate technologies, doctrine, and organizations to identify methods of enhancing lethality, survivability, and interoperability of joint contingency forces and to provide situational awareness to light forces that would be comparable to mechanized forces by evaluating technologies, doctrine, and organizations.[81]

Concurrently, there would be strike force experimentation. Strike force development stemmed from the American experience during Operations Desert Shield/Storm of 1990-91. Studying the deployment of units into Southwest Asia, the U.S. Army learned critical

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[81]Memorandum for Data Call Addresses, subj: Issue and Initiative Submission and Review Process, 12 Feb 99; "HIMARS for Deployable 'Heavyweight' Fires," Field Artillery, May-Jun 98, p. 33, Doc III-78; Sherman, "Lighten Up," pp. 57-58; Briefing (Extract), subj: Army Experimentation Campaign Plan, 1998; Briefing, subj: Army Experimentation Campaign Plan, Mar 99, Doc III-79.

lessons about projecting military power from the United States. As the Chief of Staff of the Army, General Dennis J. Reimer, noted in 1998, the Operations Desert Shield/Storm disclosed that the Army had to change. Deploying a heavy brigade to the Persian Gulf took eighteen days in 1990. In the future United States military forces would not have the luxury of taking so long to organize enough combat power in theater to prevent a major conflict. Potential enemies realized that giving the Americans time to build up their military forces and to set the terms of fighting could lead to disaster and defeat. Given this, potential enemies would most likely not permit the Americans to build up their military power at their leisure and then fight on their own terms. With this particular lesson of the Gulf War firmly fixed in the minds of the American military leadership, the U.S. Army, the Defense Science Board, the Army Science Board, and numerous studies conducted during the six years after the war concluded that the American military would have to force its way into the theater of operations against armed opposition in the future.[82]

[82]Memorandum for LTC Charles Hernandez, TF2000, subj: SME Review of AECP for 1998 Annual Command History, 31 Mar 99; Information Paper, subj: U.S. Army Strike Force, 4 Mar 99, Doc III-80; TRADOC News Service, "Army Eyes New Swift Deployment Headquarters," 4 Mar 99, Doc III-81.

In view of this scenario, the Army had to explore ways of making itself more deployable by cutting down the time required to move forces from the United States to overseas hot spots. From the perspective of 1998, future U.S. armed forces would have to possess the ability of applying decisive military power to deter or defeat acts of aggression, and this would require a rapidly deployable active and reserve component force with the capabilities of fighting across the full spectrum of conflict.[83]

As of 1998, TRADOC, which had the lead for force design options, noted that either light forces or mechanized forces were available to deter or defeat an aggressor and that each had strengths and weaknesses. Although Army XXI with its enhanced its fire power, command and control, and survivability would have outstanding early entry capabilities and would possess strategic mobility, a light force of the future would still lack sufficient power to defeat a mechanized force. At the same time Army XXI would improve the mechanized force's command and control, strategic mobility, survivability, and lethality, but it still would require prepositioned equipment to enhance strategic mobility further. Thus, as action officers in Task Force 2000 noted, a gap existed between the light forces' and heavy forces' capabilities that influenced the ability to respond rapidly to deter or defeat aggression.[84]

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[83]Briefing (Extract), subj: Army Experimentation Funding Campaign Plan, 1998; Msg, subj: Army Experimental Campaign Plan, 29 Sep 98.

[84]Briefing (Extract), subj: Army Experimentation Funding Campaign Plan, 1998; Interview, Dastrup with LTC Charles Hernandez, TF 2000, 2 Mar 99, Doc III-82; MAJ C. Christopher Mack and MAJ William M. Raymond, Jr., "Strike Force: Fires for the Future," Field Artillery, Nov-Dec 98, pp. 16-17, Doc III-83.

Because of the deficiencies of either force and the requirement for a rapidly, deployable force, TRADOC at the direction of the Chief of Staff of the Army, General Dennis J. Reimer, began developing the Strike Force concept as early as 1996 and subsequently initiated Strike Force experimentation in 1998. Through Strike Force experimentation the Army planned to develop and field an adaptable, rapidly deployable force that would be decisive upon arrival and that could capitalize upon the best of light and mechanized forces. As envisioned early in 1998, the force would be a relatively small force with three thousand to five thousand soldiers and would be equipped and trained to deploy anywhere in the world in four to seven days by air or sea in response to a wide spectrum of threats and contingencies from early entry to peacekeeping operations. Equally important, the force would be able to deploy as rapidly as other early entry forces, would be more survivable, lethal, and maneuverable, and would present a smaller and more sustainable profile than current heavy force designs.[85]

In 1998 the Army examined four options to meet the requirement for a deployable, lethal force that combined the strengths of light and heavy forces in 1998. First, the Army could modernize the 2nd Armored Cavalry Regiment with near-term off-the-shelf technology. Second, the Army could develop a prototype Strike Force by anticipating capabilities and technologies that land forces would require twenty-five to thirty years in the future. Third, the Army could exploit leap-ahead technology to upgrade the 2nd Armored Cavalry Regiment dramatically. Fourth, the Army could design a force with force packaging and tactical tailoring to produce the capability of intervening rapidly and decisively. As TRADOC noted, options one through three spotlighted capabilities that would form a standing organization core group and would have unit cohesion as a primary goal. In comparison, the fourth option centered on creating a highly deployable headquarters that could command and control a tailored force of Army of Excellence or Army XXI capabilities to meet the situation.[86] As the new Commanding General of TRADOC, General John Abrams noted in October 1998, "We're probably going to have a blend of these

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[85]Mack and Raymond, "Strike Force: Fires for the Future," pp. 16-17; Information Paper, subj: U.S. Army Strike Force, 2 Mar 99; "Strike Force Army's 'Future' Test Bed," Fort Sill Cannoneer, 4 Mar 99, p. 2a, Doc III-84.

[86]Msg, subj: Army Experimental Campaign Plan, 29 Sep 98; Sherman, "Lighten Up," p. 60.

ideas."[87]

[87]Ibid.; Memorandum for LTC Charles Hernandez, TF2000, subj: SME Review of AECP for 1998 Annual Command History, 31 Mar 99.

Although the final force structure design for the Strike Force did not exist at the end of 1998, Task Force 2000 and the U.S. Army Field Artillery School (USAFAS) were moving out to develop the Strike Force headquarters effects node that would be an integral part of the Strike Force headquarters combat information center. The node would assemble real time information, process that information, and direct the appropriate effects (lethal and non-lethal) to the required place in the battle space. As the Chief of Task Force 2000, Colonel Jerry C. Hill, explained, the headquarters effects coordination node would have three major areas -- the intelligence and targeting cell, the lethal effects cell, and the non-lethal effects cell. These cells would give the commander the desired effect, such as disrupting an enemy supply line or removing a communications center, without him worrying about the source of the action. It could come from air strikes, field artillery, or any other source.[88]

Flexibility also influenced field artillery assets for the Strike Force. The Field Artillery School anticipated a composite field artillery battalion of High Mobility Artillery Rocket Systems (HIMARS), the Advanced Technology Light Artillery System (ATLAS), a platoon of AN/TPQ-47 radars, a terminal effects coordination platoon, and an electronic attack platoon. While HIMARS would provide long-range fires, ATLAS, renamed the Future Direct Support Weapon System in 1998, would furnish fires for close operations. Functioning as part of the command post, the effects coordination platoon would have state-of-the-art communications equipment and would plan, coordinate, and synchronize lethal and non-lethal effects from space, sea, air, or ground-based deliver systems throughout the battle space.[89]

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[88]Ibid.; Msg with Atch, subj: Strike Force Effects Coordination Node, 25 Mar 99, Doc III-85; "Schoolhouse Developing 'Effects' Headquarters," Fort Sill Cannoneer, 4 Mar 99, p. 2a, Doc III-86; Fact Sheet, subj; Strike Force Headquarters Effects Coordination Node Development: A Depth and Simultaneous Attack Battle Lab and Task Force 2000 Initiative, 24 Mar 99, Doc III-87; Issue Submission Form, undated, Doc III-88.

[89]Mack and Raymond, "Strike Force: Fires for the Future," pp. 18-19.

Although the Field Artillery School was anticipating which fire support systems would be part of the Strike Force and considerable thought was going into the composition of the Strike Force, the Army focused its attention on designing the headquarters. Late in 1998 and early 1999, the Army expected to form a Strike Force headquarters from existing resources using the 2nd Armored Cavalry Regiment to test the concept.[90] Beyond Strike Force, the mechanized axis centered on the first digitized division and corps -- the 4th Infantry Division and III Corps. In division capstone exercises in March and September 2001, the digitized 4th Infantry Division would demonstrate its go-to-war capability under a realistic and demanding scenario. The exercise would also validate division design, provide a comparative understanding of the new force in relationship to the Army of Excellence force structure, demonstrate potential training methods for the future, verify the interface of all components of the Army Battle Command System, and help to refine doctrine, training, leadership, organization design, materiel requirements, and soldier support (DTLOMS).[91]

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[90]Msg with Atch, subj: Strike Force Effects Coordination Node, 25 Mar 99; TRADOC News Service, "Army Eyes New Swift Deployment Headquarters," 4 Mar 99.

[91]Memorandum for LTC Charles Hernandez, TF2000, subj: SME Review of AECP for 1998 Annual Command History, 31 Mar 99; Msg, subj: Army Experimental Campaign Plan, 29 Sep 98; Briefing (Extract), subj: Army Experimental Funding Campaign Plan, 1998; Briefing, subj: Division Capstone Exercise, 16 Feb 99, Doc III-89; Briefing, subj: Army Experimental Campaign Plan Video Teleconference, 20 Feb 98,

EFFECTS COORDINATION CELL

Doc III-90; Steele, "The Army XXI Heavy Division: First Blueprint of the Future Army," p. 34.

Looking into the future, the U.S. Army Field Artillery School (USAFAS) saw a battlefield that would be characterized by distributed operations with non-linear, non-contiguous, and well-dispersed forces. To win on that battlefield the joint force or combined arms commander would require effective fires but should not have to worry about their origins. The commander should only have to be concerned about the effects of the fires. For the Field Artillery, this meant providing robust fires platforms with the ability to conduct technical fire direction, revolutionizing the methods of distributing fires, tailoring the force to meet the threat, and designing a radically different team approach for streamlining fire support organizations and battle staff processes. Essentially, the Field Artillery had to modify its existing fire support operations and organizations that had their roots in the first part of the twentieth century for a new paradigm of effects based fires.[92] As one Field Artillery officer pointed out, "Current digital operations are just the old way of executing fire support operations, but now we sometimes plan and execute with computers. . . . We have refined and digitized this process [fire support]; but, at its base, it has changed little since the early 20th century."[93]

To transform fire support involved integrating and synchronizing fires from one organization. The Field Artillery had to go beyond the sensor-to-shooter links being developed late in the 1990s. Twenty-first century fires would require sensor linkages to a much broader range of on-demand effects through a centralized Effects Coordination Cell (ECC) that would be linked to a multitude of sensors and effects providers, such as field artillery, naval gun fire, close air support, precision munitions, unmanned aerial vehicles, and even satellites; and would demand consolidating existing fire support elements at the various command echelons because they could not adequately leverage all effects deliverers and sensors. As envisioned at the end of 1998, the ECC would be capable of establishing, altering, and terminating direct sensor-to-effects links within seconds without lengthy coordination to meet rapidly changing battlefield requirements, would provide a full spectrum of effects management in decisive, shaping, and sustainment missions, and could be tailored

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[92]BG Toney Stricklin, "Fires: The Cutting Edge for the 21st Century," Field Artillery, May-Jun 98, pp. 22-23, Doc III-91; Interview, Dastrup with MAJ Gregory A. Palka, TF 2000, 30 Mar 99, Doc III-91A; Briefing, subj: The Effects Coordination Cell, 24 Mar 99, Doc III-92; Fact Sheet, subj: Futures Fires Command and Control Concept Experimentation Program, 24 Mar 99, Doc III-93.

[93]Msg with Atch, subj: ECC Info Requested, 23 Mar 99, Doc III-94.

optimally to accomplish the mission. Although the Field Artillery School's vision of the ECC's organization was still in the developmental phase at the close of 1998, it nevertheless concluded that the cell would most likely be at the brigade, division, and corps levels and would functionally integrate effects delivery systems and organizations, initiated action in 1998 to develop a prototype ECC by 1999, and probably would gain many lessons learned from the effects node being developed for the Strike Force headquarters as part of the Army Experimental Campaign Plan to modernize army organizations.[94]

DEPTH AND SIMULTANEOUS ATTACK BATTLE LABORATORY

Voice Recognition for the Advanced Field Artillery Tactical Data System

[94]Stricklin, "Fires: The Cutting Edge for the 21st Century," pp. 22-24; Briefing, subj: The Effects Coordination Cell, 24 Mar 99; Briefing, subj: Future Fires Command and Control Concept Experimentation Program, 9 Dec 98, Doc III-95; Memorandum for MAJ Gregory A. Palka, subj: SME Review of ECC for 1998 Annual Command History, 31 Mar 99, Doc III-95A; Fact Sheet, subj: Future Fires Command and Control Concept Experimentation Program, 24 Mar 99; Msg with Atch, subj: ECC Info Requested, 23 Mar 99.

In December 1997 the Depth and Simultaneous Attack Battle Laboratory initiated a project to determine the feasibility of employing speech recognition, activation, and synthesis to speech-enable existing forward observer and light unit field artillery systems. The laboratory planned to develop an initial concept for speech enabling a forward observer or light unit to show how the latest speech enabling technology with Army application hardware and software could be implemented.[95]

During 1998, the Battle Laboratory and Field Artillery School experimented with, and successfully evaluated, a voice recognition capability for the Advanced Field Artillery Tactical Data System Forward Observer System Handheld Terminal Unit, using current miniaturized speech recognition application software and voice activation technology. The project proved how voice recognition technology could be incorporated into current systems to answer doctrine, training, leadership, organizational design, materiel requirements, and soldier support (DTLOMS) issues and to enhance natural soldier-machine interface by using a hands-free, speech recognition technology. Further experimentation was planned for refining requirements.[96]

Battlefield Coordination Detachment Initiative

[95]1997 USAFACFS ACH, p. 92.

[96]Memorandum for Record, subj: Battle Laboratory Input to 1998 Annual Command History, 22 Mar 99, Doc III-96.

On 25 November 1995 the Chiefs of Staff of the Army and Air Force signed a memorandum of agreement reinforcing the liaison support between the two services. Upon signing the memorandum, the Army directed the U.S. Army Field Artillery School (USAFAS) to improve Battlefield Coordination Detachment (BCD) capabilities. The BCD was the Joint Force Land Component Commander's representative to the Joint Air Force Command Component to synchronize air and ground battles.[97] For the Army, signing the memorandum was a critical step. At the time in 1995, the Air Force fought the air war on computer terminals, while the BCD employed telephones and map boards to accomplish its mission. The BCD initiative would provide Army Battle Command Systems (ABCS) to enhance the Army's ability to incorporate its operational requirements into the air tasking order development process. ABCS systems would also furnish improved automation tools through digitization to help interpret the ground war for the Joint Force Air Component Commander. Ultimately, the initiative involved digitizing the 1st BCD, the 2nd BCD in the U.S. Army Reserves, the Korean BCD, and the U.S. Army, Europe BCD to provide a seamless interface between the Army Force Commander and the Joint Force Air Component Commander. With equipment testing completed in 1997, fielding the four BCDs would occur in 1997-98.[98]

In 1997-98 the Army fielded its suite of ABCS systems to the BCDs. During November and December 1997, the U.S. Army, Europe BCD received its ABCS systems with new equipment training being conducted to bolster confidence and to ensure operator and unit proficiency. Subsequently in May 1998, ABCS systems were fielded to the Korean BCD. Afterwards in August and September 1998, the 2nd BCD at Hurlburt Field, Florida, received its initial ABCS suite and new equipment training. During the fieldings, the Army learned that the systems were complex and required highly trained administrators to keep them running and network engineers to establish and maintain electronic connectivity with dispersed units and concurrently identified strengths and weaknesses for correction.[99]

Theater Precision Strike Operations Advanced Concept Technology Demonstration

On 21 November 1997 the Department of Defense approved Theater Precision Strike Operations Advanced Concept Technology Demonstration as a new start for Fiscal Year (FY) 1998 that would run for six years in response to the Joint Forces Land Component Commander's requirement for an enhanced capability to conduct theater precision engagements and fires. In exercises planned for FYs 1999, 2000, and 2001, the demonstration would exercise and evaluate existing and emerging technology on a synthetic battlefield that would

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[97]1997 USAFACFS ACH, p. 62.

[98]Ibid., pp. 62-63; Fact Sheet, subj: Digitized BCD Initiative, Feb 98, Doc III-97; MAJ Frank J. Tipton, "Digitizing BCDs," Field Artillery, Mar-Apr 98, pp. 18-19, Doc III-98; COL Bruce A. Brant, "Combined Operations and the BCD," Field Artillery, Mar-Apr 98, pp. 17-21, Doc III-99.

[99]Tipton, "Digitizing BCDs," pp. 18-19; Fact Sheet, subj: Digitized BCD Initiative, Feb 98; Memorandum for Record, subj: Bat Lab Input to 1998 Annual Command History, Doc III-96.

incorporate live, virtual, and constructive simulations. At the same time the demonstration would provide emerging leave-behind capabilities with US forces in the United States and Korea.[100]

[100]1997 USAFACFS ACH, p. 63.

In 1998 the Theater Precision Strike Operations Advanced Concept Technology Demonstration conducted its first exercises. During the year, the Depth and Simultaneous Attack Battle Laboratory provided extensive support for Foal Eagle, Reception, Staging, Onward Movement and Integration, SummerEx and Ulchi Focus Lens, and III Corps's Warfighter trainup and Corps Warfighter exercises. These exercises demonstrated a new capability to monitor and execute the counterfire battle at theater level using the prototype Counterfire Common Operational Picture that was used in the Automated Deep Operations Coordination Cell. The Counterfire Common Operational Picture was also scheduled to be incorporated into the Advanced Field Artillery Tactical Data System along with the highly successful Automated Weapon Target Pairing functionality that had been developed during the Precision/Rapid Counter Multiple Rocket Launcher demonstration. As shown in the demonstrations, the Automated Weapon Target Pairing functionality had the ability of being applied to rocket, missile, and cannon weapon systems. In addition, the Counterfire Common Operational Picture demonstrated joint interoperability with the Navy during the Navy's Fleet Battlefield Experiment Delta and Korean Foal Eagle exercises using the Navy's prototype Land Attack Warfare System and the Automated Deep Operations Coordination System. To furnish a significant enhancement to the ability to train and accomplish fire support tasks during the Korean exercises and the Theater Precision Strike Operations Advanced Concept Technology Demonstration, the Depth and Simultaneous Attack Battle Laboratory began working on integrating the entity-level fire support simulation into the Corps Battle Simulation.[101]

AN/TPQ-37 Selectable Weapons Locating Modes Advanced Concepts and Technology Program

In 1997 the U.S. Army Field Artillery School envisioned constantly changing mission scenarios on the Force XXI battlefield that had to be countered with minimal assets. Threat forces would range from small bands of insurgents to major military powers and would be equipped with weapons varying from obsolete to state of the art. To meet this threat the Army required versatile systems that were not dedicated to specialized tasks.[102]

As of 1997, the AN/TPQ-37 Weapon Locating Radar System failed to meet the desired characteristics. It was optimized for the mid- to long-range artillery threat with mortar and rockets being considered secondary and forwarded the information collected to counterfire or intelligence personnel through the Advanced Field Artillery Tactical Data System (AFATDS).[103]

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[101]Memorandum for Record, subj: Battle Lab Input to 1998 Annual Command History, 22 Mar 99.

[102]1997 USAFACFS ACH, p. 63.

[103]Ibid.

In view of this, the Field Artillery School initiated a project to optimize the Q-37 so that it could locate a wider variety of hostile weapons accurately. As planned in 1997, the project would provide operator selectable sub-modes of operation that would allow the deployment of an AN/TPQ-37 for selected missions where an AN/TPQ-36 and an AN/TPQ-37 would have been required or where an AN/TPQ-37 was already deployed. This would make the Q-37 more versatile, less dedicated to specialized tasks, and more suitable to future battlefields.[104]

In keeping with the objective, the Army awarded Raytheon-Hughes Corporation a contract late in Fiscal Year (FY) 1997 for execution in FY 1998 to demonstrate a means of optimizing the Q-37 radar to locate and discriminate a wider body of hostile weapons accurately and to be tailored to the threat. During FY 1998, the program completed a laboratory demonstration successfully with preliminary results indicating that the detection rate for rockets was eighty-one percent as compared to zero percent without the selectable mode software enhancement to the Q-37.[105]

Assessment of Crusader Operational Concepts for Digitized Battlefield Operations

In 1997-98 the Depth and Simultaneous Attack Battle Laboratory conducted experiments to assess operational and organizational concepts for employing the Crusader self-propelled 155-mm. howitzer and its resupply vehicle. Equipped with the Advanced Field Artillery Tactical Data System (AFATDS) in command posts, participants formed into a field artillery brigade battle staff and two artillery battle staffs and used a synthetic battlefield environment to perform critical fire support tasks for brigade-level operations. Crusader forces

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[104] Ibid., pp. 63-64.

[105] Memorandum for Record, subj: Battle Lab Input to 1998 Annual Command History, 22 Mar 99.

operated as singles, pairs, and platoons to conduct lethal and non-lethal attacks against 2005-timeframe threats.[106]

[106]Fact Sheet, subj: Crusader Concept Experimentation Program 2: Shaping the Firepower Revolution, Feb 98, Doc III-100; Dr. Linda G. Pierce, Walter M. Millspaugh, and William A. Ross, "Defining the Operational Concepts for the Crusader System," Army RD and A, Jan-Feb 99, pp. 29-32, Doc III-101; Memorandum for Record, subj: Battle Lab Input to 1998 Annual Command History, 22 Mar 99; 1997 USAFACFS ACH, p. 64.

Initial findings provided critical insights into non-linear, information-centric, twenty-first century warfare. For example, Crusader's information and logistics requirements highlighted the need for improved situational awareness and the requirement to reevaluate the roles and responsibilities of staffs at all levels of command. The experiments also reaffirmed the need for interoperability among systems and digital processors to execute precision engagements against high-payoff targets and to support maneuver forces on the digitized battlefield.[107]

Army-Air Force Joint Interoperability

During the Battlefield Coordination Detachment Conference in February 1998, the Depth and Simultaneous Attack Battle Laboratory discovered the need for improving digital interoperability between Army and Air Force command and control. To this end the battle laboratory worked with Program Manager Field Artillery Tactical Data Systems to establish the digital passing of targeting related messages between the Air Force's Theater Battle Management Core Systems (TBMCS) and the Advanced Field Artillery Tactical Data System (AFATDS). As the Army's representative to the combined test force for TBMCS testing, the Battle Laboratory ensured that the Army Battle Command System's (ABCS) interface with the TBMCS performed as required to establish joint interoperability.[108]

Special Operations Forces Concept Experimentation Program

During 1998, a concept experimentation program was conducted to link a call for fire from a forward-deployed special operations observer to a rear command post digitally. This need arose during the observations at Roving Sands 1996. Historically, the

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[107]Fact Sheet, subj: Crusader Concept Experimentation Program 2: Shaping the Firepower Revolution, Feb 98; Memorandum for Record, subj: Battle Lab Input to 1998 Annual Command History, 22 Mar 99; Pierce, Millspaugh, and Ross, "Defining the Operational Concepts for the Crusader System," pp. 29-32.

[108]Memorandum for Record, subj: Battle Lab Input to 1998 Annual Command History, 22 Mar 99, Doc III-96.

teams sent all communication traffic to the special forces command and control element. The element would then write down the message and hand carry it to the responding agent. This method was timely but redundant. The need for special forces to send traffic digitally to a respondent Army Battle Command System became the solution. A concept was written and forwarded to the U.S. Army Training and Doctrine Command (TRADOC) for funding under the concept experimentation program. TRADOC awarded funding. The special operations forces concept experimentation program involved determining the Army fire support digital connectivity between the special forces operational detachment alpha and special operations forces command and control architecture with currently fielded special operations forces communications packages.[109]

Joint Project Optic Windmill III

[109] Ibid.

Between 11 and 19 May 1998 the Depth and Simultaneous Attack Battle Laboratory participated in the United States European Command (USEUCOM) and Dutch sponsored Joint Project Optic Windmill III. During the project, USEUCOM focused on the refinement of NATO, USEUCOM, and Dutch national tactics, techniques, and procedures and command, control, communications, and computer architectures for conducting active defense, passive defense, attack operations, conventional counterforce operations, and battle management/command, control, communications, computers, and intelligence.[110]

Advanced Fire Support System

On 18 November 1998 the Depth and Simultaneous Attack Battle Laboratory received U.S. Army Training and Doctrine Command (TRADOC) proponency for the Advanced Fire Support System. The concept for the system had been around for several years. However, until the Defense Advanced Research Projects Agency (DARPA) established a requirement in 1998 to develop this futuristic effects delivery system, the U.S. Army Field Artillery School had little interest. After obtaining proponency, the Depth and Simultaneous Attack Battle Laboratory established active partnerships with the Infantry, Aviation, Armor, and Air Defense Artillery to define the initial concept requirements for the Advanced Fire Support System.[111]

SENSE-AND-DESTROY-ARMOR MUNITION

Early in the 1970s, the Army projected that the Warsaw Pact's future armored forces would be sophisticated. The Pact's combat formations would be composed of mixes of maneuver and armored vehicles, field artillery, logistical units, and command and control elements. Equally important, the Warsaw Pact would have the capability of employing highly technical target acquisition and electronic countermeasure devices.[112]

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[110] Ibid.

[111] Ibid.

[112] 1994 USAFACFS ACH, pp. 120-21.

To offset the enemy's numerical superiority, the Army had to improve its fire support. The Army could increase the number of weapons, but manpower and monetary constraints discouraged taking this course of action. After further consideration the Army turned to upgrading training and technology as a means of enhancing fire support because they would exploit current and future resources more efficiently. As a vital part of enhancing fire support that included introducing new weapons, target acquisition systems, command and control systems, support systems, and doctrine, the Army initiated action to develop smart munitions (precision munitions) that could be steered to the target and that would be more deadly than existing conventional high-explosive fragmentation projectiles.[113]

Besides introducing the Copperhead projectile, which required a laser designator to guide it to a target, the Army started work to on the Sense-and-Destroy Armor (SADARM) munition, which was a fire-and-forget precision munition, at the beginning of the 1980s to counter enemy armor. The projectile would be delivered over the target where it would dispense submunitions that would orient, stabilize, and descend by parachute in a controlled spin, searching a circular area with a diameter of approximately 135 meters. When a submunition's infrared, active and passive millimeter wave sensors confirmed a target, the submunition's warhead would fire a self-forging tantalum penetrator to destroy the target upon impact.[114]

After several years of development on the 155-mm. SADARM, the Army conducted technical testing in 1993 to determine if low-rate production could begin during the fourth quarter of Fiscal Year (FY) 1993. Based upon expected technical performance, the Army established a criteria of twenty-four hits from seventy-two submunitions. If SADARM met the effectiveness criteria, production would begin. However, technical difficulties during the June 1993 performance test led to a high dud rate and an insufficient number of hits (nine hits from seventy-two submunitions). As a consequence, serious questions were raised about the munition's reliability. The unexpected poor performance compelled the Army to halt the test and to cancel the Army System Acquisition Review Council (ASARC) and Defense Acquisition Board (DAB). In the meantime, the Multiple-Launch Rocket System (MLRS) SADARM experienced expulsion problems and an excessive number of duds.[115]

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[113]Ibid., p. 121.

[114]1996 USAFACFS ACH, pp. 100-01; 1997 USAFACFS ACH, p. 66.

[115]1995 USAFACFS ACH, pp. 103-04.

In view of the difficulties, the Army restructured the SADARM program and simultaneously encountered confusing guidance from Congress. In September 1993 the Army Acquisition Executive approved a proposal by the SADARM Program Manager to fix the problems and to test the munition again, which meant increasing developmental time. Meanwhile, a joint Senate and House Appropriations Committee appropriated money in FY 1994 to terminate the SADARM program, while a joint Senate and House Authorizations Committee authorized money to conduct further analysis for a 155-mm. SADARM only. Based upon legal guidance, the Army directed the SADARM Program Manager to continue work on the munition, although confusion over the direction that the program should go existed.[116]

Intensive efforts by the SADARM Program Manager and the contractor corrected the technical problems. During the technical tests in April 1994, the munition scored eleven hits and eight near misses from the thirteen projectiles (twenty-six submunitions) fired. This success demonstrated that SADARM was technically mature and reliable as it approached the low-rate production decision in the second quarter of FY 1995. The Chief of the Munitions Branch, TRADOC System Manager (TSM) Cannon, Directorate of Combat Developments (DCD), U.S. Army Field Artillery School (USAFAS), explained the importance of the accomplishments of 1994. Early in March 1995, he pointed out that the Program Manager's and the contractor's work brought the 155-mm. SADARM "back from the dead."[117]

Based on the Congressionally-directed Smart Munition Study conducted by the Field Artillery School in 1994, the Army, in the meantime, stopped all work on the MLRS variant of SADARM. Although the study reaffirmed the need for a field artillery smart munition, numerous alternatives existed for the MLRS variant, such as the Brilliant Antiarmor Preplanned Product Improved (BAT P3I) submunition. The final decision to defer work on the MLRS submunition, however, was based on a follow-on study entitled, MLRS Smart Tactical Rocket Study that identified BAT P3I as a viable alternative to a MLRS smart munition. The study also concluded that there were not any viable alternatives to the 155-mm. SADARM and halted work on a MLRS SADARM.[118]

In the October 1994 Field Artillery, (formerly called the Field Artillery Journal until mid-1987) the Chief of the Munitions Branch clearly outlined the rationale for SADARM. He pointed out that the munition was a day-night, fire-and-forget, top-attack munition that would add a new dimension to "fighting with fires" and would dramatically enhance the Army's force projection. Years of engineering had produced a munition that was more lethal than high-explosive munitions or dual-purpose improved conventional munitions (DPICM) and that was easier to employ than the Copperhead precision munition. In fact, gun crews could handle SADARM like any other 155-mm. projectile. Thus, at the end of 1994, the SADARM program was poised for Department of Defense approval to enter low-rate initial production.[119]

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[116] Ibid. pp. 104-05.

[117] Ibid., p. 105.

[118] Ibid., pp. 105-06.

[119] Ibid., p. 106.

Early in 1995, three separate decisions led to low-rate initial production in preparation for the Initial Operational Test and Evaluation in 1998. Based upon the munition's performance during the testing of April 1994 and the ASARC review of December 1994, on 13 January 1995 the Army Acquisition Executive, Gilbert F. Decker, approved the SADARM program to proceed to the Defense Acquisition Board (DAB) because the Department of Defense had oversight authority. However, he requested that the Program Manager pursue cost-reduction efforts to save the government money. On 30 March 1995 the DAB conducted a low-rate production review of the SADARM program. In view of the ASARC's decision and the Joint Requirement Oversight Council's validation of key performance parameters on 16 February 1995, the DAB approved entry into low-rate initial production. Likewise, the ASARC directed restructuring the program to reduce costs.[120]

Notwithstanding the decision to move into initial low-rate production, the Army and contractor still had one major concern with the performance of SADARM. During testing, the submunitions often collided after being ejected from the carrier projectile. To fix the shortcoming the contractor developed a belleville spring to separate the submunitions when they were ejected. Although subsystem testing in the summer and fall of 1995 demonstrated that the spring functioned properly, the Field Artillery School and contractor were waiting official recognition at the end of 1995 that the shortcoming had been fixed.[121]

Tests in 1996 and 1997 validated the improvements to SADARM. In April and May 1996 during Engineering and Verification Tests at Yuma Proving Ground, Arizona, SADARM produced eight hits from nine projectiles. Subsequently, SADARM first-article testing at Yuma Proving Ground in December 1996 yielded five hits from four projectiles (eight submunitions). During Initial Production Tests in the summer and early winter of 1997 at Yuma Proving Ground and the Cold Regions Test Center, Alaska, SADARM's performance exceeded the Army's expectations to permit moving into operational testing in mid-1998 and towards the ASARC of December 1998.[122]

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[120]1996 USAFACFS ACH, p. 104; 1997 USAFACFS ACH, p. 68.

[121]1995 USAFACFS ACH, pp. 106-07.

[122]1996 USAFACFS ACH, p. 105; 1997 USAFACFS ACH, pp. 68-69; Fact Sheet, subj: SADARM, Apr 98, Doc III-102; Fact Sheet, subj: SADARM, Feb 99, Doc III-103.

Work on SADARM continued into 1998. During the initial operational test and evaluation, SADARM performed at a lower level than anticipated. Because of this, the Army inserted a limited user test into the SADARM program for the third quarter of FY 2000. This action to verify reliability and performance pushed back fielding of the basic SADARM from FY 1999 to FY 2000. Meanwhile, the Army initiated a product improvement (PI) program in earnest in FY 1999 that would lead to the fielding of a SADARM PI with improved sensors, a larger footprint, and increased lethality in FY 2003. These SADARM PI munitions would also be fielded in the extended range XM982 SADARM variant projectile.[123]

CRUSADER

Initially part of an ambitious acquisition program in the 1980s aimed at reducing procurement and sustainment costs by

[123]Fact Sheet, subj: XM982 Extended Range Projectile, Feb 99, Doc III-104; Fact Sheet, subj: SADARM, Feb 99; Fact Sheet, subj: SADARM, Apr 98; Memorandum for Dick McKean, TSM Cannon, subj: SME Review of SADARM Portion of 1998 Annual Command History, 18 Feb 99, Doc III-105.

introducing a family of armored vehicles mounted on a common chassis, the Crusader, a self-propelled 155-mm. howitzer, and its resupply vehicle promised to revolutionize cannon field artillery and to serve as the next-generation 155-mm. self-propelled howitzer. Even though studies conducted late in the 1970s and early in the 1980s recognized the need for Crusader, the U.S. Army Field Artillery School (USAFAS) revalidated the requirement for the howitzer and its resupply vehicle in the 1990s. According to TRADOC System Manager (TSM), Cannon, in the Directorate of Combat Development (DCD), the system would give the Army a dynamic warfighting capability. The M109A2/A3 self-propelled 155-mm. howitzer and its successor, the M109A6 Paladin self-propelled 155-mm. lacked sufficient mobility, survivability, lethality, and effectiveness for combat in the twenty-first century. In all areas of concern, Crusader exceeded the capabilities of the other two howitzers significantly and would be the premier cannon system in the world upon being fielded in 2005.[124]

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[124]1995 USAFACFS ACH, pp. 113-14; Report (Extract), subj: Army Heavy Force Modernization Plan, 1998, p. F1, Doc III-106. To minimize confusion the name "Crusader" will be used when referring to the howitzer and its resupply vehicle. Through the early 1990s, the Crusader was called the Advanced Field Artillery System and the resupply vehicle was called the Future Armored Artillery Resupply Vehicle. Both were separate programs. See Paul F. Pearson's and Glenn K. Otis's "Crusader: Linchpin of the Force XXI Army," Army, Nov 96, pp. 45-47, for an interesting discussion about the rationale for Crusader by two retired Army officers.

As demonstrated by Operation Desert Storm early in 1991, moreover, the Army critically required a new field artillery system to replace the M109A2/A3, and the Paladin that was scheduled to be fielded shortly would provide only a temporary solution. Of the three combat arms (Infantry, Field Artillery, and Armor), the Field Artillery had the most obsolete systems. Yet, the Armored Systems Modernization program as it was structured through mid-1991 made Crusader the fourth priority behind the Block III tank, the Future Infantry Fighting Vehicle, and the Combat Mobility Vehicle.[125]

In view of this incongruity with reality, a General Accounting Office (GAO) report and the Senate Armed Services Committee's Fiscal Year (FY) 1992 budget report severely questioned the Army's priorities. Pressured by the General Accounting Office's report and the Senate Armed Services Committee, the Army revamped its Armored System Modernization program. On 30 October 1991 the Army sent Congress a position paper that explained a reordering of priorities. The Army deferred further development on the Block III Tank, the Future Infantry Fighting Vehicle, and the Combat Mobility Vehicle. Options to resume development on the systems would be left open to meet the threat, while key components -- cannon research and engine development -- would be retained in the technology base for continued development.[126]

Unlike the earlier decision to make the Block III tank the number one priority, the Army made Crusader with its resupply vehicle, formerly known as the Future Armored Resupply Vehicle, the lead Armored System Modernization projects and decided that they would be developed concurrently. At the same time the Army abandoned the strategy of adopting a common chassis for armored systems that had been the focal point in its modernization effort since the mid-1980s. Only commonality between Crusader and its resupply vehicle remained. Furthermore, development on Crusader after late-1991 focused on testing technologies to validate their maturity and utility to reduce the risk of introducing unsuitable technology. This meant developing the gun, propellant, and field artillery modules to be mounted on the chassis.[127]

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[125]1995 USAFACFS ACH, p. 114.

[126]Ibid., pp. 114-15.

[127]Ibid.

Meanwhile, work on the propellant moved forward. In September 1991 a General Officer Steering Committee (GOSC), chaired by Major General Richard D. Beltson and Brigadier General James J. Cravens, Jr., reviewed the firing and analytical test data for unicharge and liquid propellant. Based upon liquid propellant's growth potential, its ability to achieve the required rate of fire and range, its capability of being supported more easily logistically, and its life cycle costs, the committee picked it for Crusader. However, additional testing and analysis would be required before final design work could proceed. Although it chose liquid propellant, the committee recommended continuing work with unicharge as a backup to satisfy the requirements of Crusader if needed and to meet the requirements of current weapon systems.[128]

The Assistant Secretary of the Army for Research, Development, and Acquisition, Stephen K. Conver, followed up on the committee's recommendations. Early in November 1991, he directed the Program Executive Officer (PEO), Armored Systems Modernization, to continue development of liquid propellant and the next-generation regenerative liquid propellant gun for Crusader. Some within the Army considered the propellant to be a risky choice because it had not been completely developed and could be expensive. At the same time Mr. Conver tasked the PEO to continue work on unicharge at a minimum level of effort that was consistent with current funding. The focus of this was to identify and resolve the critical technical and engineering issues related to the application of unicharge propellant to Crusader.[129]

Work on liquid propellant and regenerative liquid propellant gun demonstrated promise. Early in 1992, testing of liquid propellant by firing fifty-two rounds at the Army's Yuma Proving Ground, Arizona, produced favorable results. Employed in a 155-mm. brassboard gun, which was essentially a laboratory gun to prove the capabilities of the technology, liquid propellant fired a rocket assisted projectile 44.4 kilometers to surpass the required range by 4.4 kilometers and shot an unassisted projectile 33.2 kilometers to clear the required range of 30 kilometers. In addition to the increased range, the propellant was more accurate, safer, and less expensive than existing propellants. In August 1993 the regenerative liquid propellant gun, a critical component of Crusader, fired a three-round burst of fire. This represented a key technological breakthrough and indicated that the gun and propellant could potentially satisfy the requirement for rapid fire and give the weapon the ability to fire a one-gun time-on-target.[130]

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[128]1996 USAFACFS ACH, p. 108.

[129]Ibid., pp. 108-09.

[130]1995 USAFACFS ACH, p. 117.

After several years of work, two critical problems with the propellant surfaced in 1995 to influence the direction of the Crusader program. In the fall of the year, the Army realized that it required more money than was available to execute the demonstration and validation phase. Projected costs exceeded the money allocated, and obtaining additional funding required Congressional approval. As TSM Cannon explained, the costs of developing liquid propellant raised the affordability issue. The propellant was too expensive to develop in the demonstration and validation phase. To keep the work going the Army had to find an affordable proposal because the liquid propellant Crusader was unaffordable, and unicharge presented a viable, cost-effective alternative.[131]

Chronic problems also plagued the development of liquid propellant. It decomposed rapidly, combusted easily in storage, was incompatible with some metals being used in Crusader's cannon system, and was corrosive. Along with the funding issue, the state of liquid propellant technology and a series of incidents with liquid propellant between 1991 and 1995, such as a fire caused by the propellant leaking from a storage tank, caused the Army to question the wisdom of developing the propellant and raised the possibility of employing solid propellant, unicharge, which was renamed the Modular Artillery Charge System (MACS) in 1995.[132]

In light of the affordability and technological issues, the Army conducted a rigorous comparison of liquid propellant and MACS in 1995. Both propellants met user requirements, and the operational performance differences between the two propellants were minimal. Regardless of the propellant, Crusader performed much better than the Paladin and would make the field artillery force more lethal, survivable, and mobile to satisfy the requirements of the twenty-first century. Considering that the MACS Crusader met all of the critical user needs and was less expensive than liquid propellant and that liquid propellant required further costly and extensive technological work before it would be employable, the Field Artillery School recommended late in 1995 employing MACS in the Crusader. A MACS Crusader was affordable and operationally effective and not a high-risk technology like liquid propellant. Given this, the Field Artillery School strongly urged the Army to change to solid propellant for the Crusader.[133]

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[131] 1996 USAFACFS ACH, p. 110.

[132] Ibid., pp. 110-11.

[133] Ibid., pp. 111-12.

As work was being done to mature individual technologies, such as the engine, the transmission, the cooled cannon, and the docking and ammunition storage and handling subsystems that would be the foundation of the Crusader, the Army made the decision about the propellant.[134] In a memorandum on 15 March 1996, the Assistant Secretary of the Army for Research, Development, and Acquisition, Gilbert F. Decker, wrote, "Troubling and persistent technical problems, programmatic risk, and growing concerns about affordability [with liquid propellant] have caused us [the Army] to reassess the prudence of continuing with liquid propellant for Crusader."[135] Mr. Decker then directed establishing solid propellant as the propellant of choice for the Crusader and restructuring the current Crusader program. The Army had to incorporate the change to solid propellant into the existing contract and execute the most cost-effective demonstration and validation contract. Equally important, the decision permitted staying within the budget.[136]

In the meantime, USAFAS confronted the issue of examining alternative self-propelled 155-mm. howitzers to the Crusader. In January 1995 the Milestone I Acquisition Decision Memorandum for Crusader, written by the Office of the Secretary of Defense, required the Army to evaluate foreign systems, specifically the German PzH2000 self-propelled 155-mm. howitzer, to gain a better appreciation of the Crusader. Subsequently, in November 1995 the Army tasked the Project Manager for Crusader to determine if the PzH2000 met the requirements for Crusader.[137]

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[134]"Crusader Update," Field Artillery, Mar-Apr 98, p. 11, Doc III-107.

[135]Ibid., p. 112.

[136]Ibid.

[137]Ibid., pp. 112-13.

This assignment led to a series of meetings in 1996 with the prime German contractor, Wegmann GmBH, and the German army, who were seeking potential foreign buyers. In May 1996 the Assistant Secretary of the Army for Research, Development, and Acquisition, Herbert K. Fallin, Jr., directed the Army to conduct a two-phase investigation to determine if the PzH2000 could be used as a Crusader. While Phase I, called the "quick look assessment," would provide a benchmark for future analysis, Phase II would be an in-depth analysis of the howitzer. Subsequent to Mr. Fallin's tasking, a team from the Directorate of Combat Developments, USAFAS, visited Germany late in June 1996 for a "quick look" assessment of the PzH2000. Although discussions with the Germans at that time disclosed significant differences between the American and German methods of collecting data, one team member concluded, "The PzH2000 is a very capable system that meets the needs of the German army."[138] The visit also revealed that howitzer could be modified to meet some Crusader requirements but that it could not meet all of them. For example, the PzH2000 did not have a companion resupply vehicle; lacked a cannon cooling system that was required to provide continuous fire support to shape the battle and support surge and peak battle conditions; had a lower rate of fire; was less accurate; and had a five-person crew whereas the Crusader had a three-person crew.[139]

Although the Germans insisted that they could modify the howitzer to meet the Army's requirements, the Army still opposed adopting it. On 6 December 1996 Mr. Fallin explained, "There are two principal reasons why the PzH2000 as a system does not meet our Crusader Objectives."[140] First, the Crusader required a cooled cannon. Second, the reduction in operational costs in crew size from the Paladin to Crusader was imperative because of projected budgets. "Although it may be possible to grow the PzH2000 system to meet Crusader requirements," Mr. Fallin added, "the analyses that we have shared with you suggest that this would not be the most efficient path to procure a system that meets our requirements."[141] Even so, the Army would still conduct a Phase II analysis in the near future to complement the Phase I analysis completed in 1996.[142]

One day later, Under Secretary of Defense, Dr. Paul G. Kaminiski, reaffirmed the Army's position. In a letter to the German Minister of Defense, Dr. Kaminiski recognized the possibility of cooperating with the Germans in developing the Army's next-generation howitzer. After hearing the advantages and disadvantages of working with the Germans and using the PzH2000, he wrote, "In the end, however, the issue became one of the rate of fire that each gun could achieve and sustain. Our Army is convinced that the requirement they have stated for a sustained rate of fire must be achieved."[143] Dr. Kaminiski then noted, "While there is a possibility the PzH can be

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[138] Ibid., p. 114.

[139] Ibid., pp. 113-14.

[140] Ibid., p. 115.

[141] Ibid.

[142] Ibid.

[143] Ibid., p. 116.

modified to meet this same requirement, that kind of modification would be essentially a new and much different program that could not offer the research and development savings necessary to justify a decision to procure PzH2000."[144] Given the costs, Dr. Kaminiski declined the German offer of using the PzH2000. Notwithstanding this, the Army should retain the PzH2000 as a backup should the Crusader "encounter serious technical difficulties."[145]

[144] Ibid.

[145] Ibid.

In its report of June 1997, the General Accounting Office (GAO) reviewed the Crusader program to determine its status and the availability of an alternative, such as the PzH2000. After conducting extensive interviews with varying levels of Army command and private industry in 1996-97, the GAO concluded, "No existing artillery system meets all of the Crusader requirements."[146] Notwithstanding its favorable report, the GAO acknowledged that the Crusader program faced considerable programmatic risks. More specifically, the technical challenges faced in developing and integrating advanced technologies, the potential compression of the program's schedule of development, and the absence of defined criteria for entering into low-rate initial production and full-rate production could jeopardize fielding the system.[147] To minimize the risk of prematurely entering into production, the GAO report recommended that the Secretary of Defense should direct the Secretary of the Army to establish criteria specifying, at a minimum, that the Crusader system should demonstrate its ability to meet all key requirements, that it was on schedule for satisfying it reliability requirements before entering low-rate initial production, and that it was operationally effective and suitable before entering full-rate production. If the requirements could not be met, an alternative system could be considered. This left open the option of adopting the PzH2000, but this was not a viable consideration as far as the Army was concerned because the German howitzer failed to meet its needs.[148]

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[146]1997 USAFACFS ACH, p. 74.

[147]Ibid., pp. 74-75.

[148]Ibid., p. 75.

Shortly afterwards, an article in Defense Daily on 21 October 1997 came to the defense of the German howitzer. It argued that the German PzH2000 would meet the needs of the Army after being improved and would be a less expensive than the Crusader. In a series of meetings and briefings during the remaining months of 1997 with congressional staffers, the Army addressed the article's contentions. Among other things, the Army pointed out that the PzH2000 would not provide revolutionary technology to support the force well into the next century, that PzH2000 modifications would still fall short of the Crusader's, and that they would not provide savings. In fact, the PzH2000 was essentially a 1990 howitzer with serious mission deficiencies that precluded consideration. The howitzer was heavy, lacked automated loading capabilities, and was still to a great extent a manual system. Ultimately, the PzH2000 failed to meet Crusader requirements, nor could it meet them with the modifications. In view of this, as far as the Army was concerned, the Crusader remained the future howitzer of choice because it would have a state-of-the-art cockpit with embedded command and control that would permit the crew to fight the system to its maximum potential, would have a robust cannon that would not overheat, would have a reliable ammunition loading system, and would have a powerful engine to keep the field artillery force up with the maneuver forces. From the Army's perspective based upon research, the Crusader would last at least forty years.[149]

In a briefing given at the direction of the Office of the Deputy Chief of Staff for Operations and Plans on 2 October 1997, the Project Manager for Crusader and the TSM Cannon from Fort Sill continued defending Crusader from its detractors. They pointed out that Paladin was a success story, but it was manpower intensive, lacked sufficient lethality, lacked the mobility of the supported force, and was a survivability risk. The Army simply required a more lethal, mobile, and survivable cannon system to meet the needs of the future because the Paladin would not be able to support Army XXI or the Army After Next. Equally important, the existing method of developing the system was cost effective and innovative to ensure that the Crusader satisfied the user's requirements at the best possible price in light of budget cuts.[150]

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[149]Ibid., pp. 75-76.

[150]Ibid., p. 76.

About the same time as the briefing, the National Defense Panel questioned the rationale for the system in light of funding restraints and even urged reducing the number of Crusaders to be produced. This proposal caused the Commandant of the Field Artillery School, Major General Leo J. Baxter, to come to the defense of the system. In letters to members of the panel, General Baxter explained, "Crusader is a world-class artillery system for the 21st century. . . . As the Chief of Field Artillery, I am somewhat in awe of Crusader's potential. It is a revolutionary fire support platform."[151] Although a direct impact of the letters was not felt in 1997, they represented a part of the Army's and the School's effort to sell the Crusader and avert possible elimination of the system, given the budget situation.[152] The letters basically won convincing support for the system, but the Field Artillery School still reaffirmed in a briefing to the Under Secretary of the Army on 2 February 1999, "Crusader is critical to 21st Century warfare" and "PzH2000 does not meet war fighting requirements."[153]

Just as budgetary considerations raised the specter of finding a less expensive alternative weapon system or reducing the number of Crusaders to be developed and modifying the Acquisition Program Baseline schedule, they also drove a reconsideration of the system's design. A "Gray Matter Team" composed of the TRADOC System Manager, the Project Manager for Crusader, and the contractor met several times over a period of several months in 1997 to review the system's requirements, the state of development, and the program objectives and to recommend the optimum balance of cost, weight, and performance parameters. Based upon their findings, the team's recommendations urged adjusting the requirements to ensure system growth and cost effectiveness in an era of budgetary constraints and led to changes in the Operational Requirement Document. As the team's work suggested, funding lay at the heart of Crusader issues in 1997. Notwithstanding threats to the system caused by budget cuts, a System Level Review on 16-18 December 1997 verified that development was moving forward as scheduled.[154]

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[151]Ibid.

[152]Ibid., pp. 76-77.

[153]Briefing, subj: Crusader: The Army XXI Firepower Revolution, 2 Feb 99, Doc III-108.

[154]1997 USAFACFS ACH, p. 77.

Based upon the steady progress in developing the required technology over the past several years and an Army requirement, the Program Executive Officer for Ground Combat and Support Systems and the Chief of Field Artillery, Major General Leo J. Baxter, evaluated the Crusader program early in 1998 to determine its future. On 12 March 1998 they officially announced, "We are satisfied with the progress that has been made and with the ability of the design to meet the Crusader system requirements. We authorize the Project Manager and TRADOC [U.S. Army Training and Doctrine Command] System Manager to continue with development of the Crusader system."[155] This decision approved the system design and authorized the fabrication of two prototypes of the howitzer for delivery in December 1999 and two prototypes of the resupply vehicle for delivery in July 1999 to support technical and operational testing.[156] According to the Crusader project officer in TSM Cannon at the Field Artillery School, the decision also took one more step towards ensuring that today's second lieutenants and privates would, indeed, have a world-class weapon with which to win quickly and decisively in any conflict of the next century.[157]

As many others involved with the Crusader system had already done, the project officer at the Field Artillery School explained its revolutionary nature of the howitzer shortly after the decision to develop the hardware had been made. The self-propelled howitzer's digitized cockpit would ensure that the system would become an all-encompassing fighting platform, would be fully integrated in the tactical Internet, would be able to exploit information dominance, and would be its own fire direction center. With this latter characteristic the Crusader would eliminate the requirement for platoon, battery, and battalion fire direction centers and would raise the qualifications necessary for cannon crew members by moving fire direction center and tactical decision-making functions to the weapon. This basically meant that crew members would need training with tactical Internet operations, tactical fire direction readouts, and mechanical and

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[155]Memorandum for Project Manager, Crusader, and Cmdt, U.S. Army Field Artillery Center, subj: PEO for Ground Combat and Support Systems and Commandant of U.S. Army Field Artillery School In-process Review of the Crusader System, 12 Mar 98, Doc III-109.

[156]Fact Sheet, subj: Crusader, Feb 99, Doc III-110; "Crusader Update," Field Artillery, Mar-Apr 98, p. 11; "Crusader Update," Field Artillery, May-Jun 98, p. 41, Doc III-111.

[157]"Update," Field Artillery, May-Jun 98, p. 41.

electronic diagnostic and prognostic readouts.[158]

Notwithstanding this, funding threatened to stall progress. The Defense Authorization Act for Fiscal Year (FY) 1999 withheld funding until critical issues were resolved favorably. Once again, the Army and Field Artillery had to defend Crusader. They explained to Congress that Crusader would be the first American howitzer since World War One that would be superior to other 155-mm. self-propelled howitzers, would fill an urgent void, would provide critical support for the Army and Joint Vision 2010, would satisfy Division XXI design requirements, would deliver the optimum balance of cost and performance, and would clearly furnish a revolution in tactical fires. This reasoning convinced Congress of the Crusader's importance to future warfighting and paved the way for funding to be obtained for FY 1999.[159]

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[158]"Crusader Update," p. 41.

[159]Briefing, subj: Crusader: FY99 Authorization Language Report to Congress, Fall 98, Doc III-112; Interview, Dastrup with MAJ Gerald W. Lucas, TSM Cannon, 4 Feb 99, Doc III-113.

Meanwhile, as outlined in the U.S. Army Training and Doctrine Command's Heavy Force Modernization Plan, written at the direction of Congress during the latter months of 1998, the Army would procure 1,138 Crusaders during the first two decades of the twenty-first century. This number would equip twenty-two active component battalions, twenty-six Army National Guard battalions, and eight prepositioned sets and would furnish howitzers for the training and logistics base. Fielding would begin in FY 2005 by fielding division artilleries and their supporting field artillery brigades in complete packages. As a result, active component and Army National Guard units would be equipped concurrently.[160]

LIGHTWEIGHT TOWED 155-MM. HOWITZER

When the United States shifted its national defense priorities from forward-deployed forces in Europe to force projection from the continental United States (CONUS) early in the 1990s when the Cold War ended, lightweight weapons attracted the Army's interest more than before. Lightweight weapons were more strategically and tactically deployable than heavier weapons. In view of the new world order and the drive for strategically deployable equipment, the Army wrote an Operational and Organizational Plan in 1991 for a lightweight towed 155-mm. howitzer, called the Advanced Towed Cannon System (ATCAS), to replace the aging M198 towed 155-mm. howitzer.[161]

To accomplish its mission of conducting expeditionary operations across the entire spectrum of conflict throughout the world, the U.S. Marine Corps, in the meantime, wrote a Joint Service Operational Requirement in 1989 for a lightweight, towed 155-mm. howitzer to provide close and long range fire support to the maneuver forces. At the time the Marine Corps employed the towed M101A1 105-mm. howitzer, which was adopted in 1939 and was 1920s technology, as a contingency weapon for certain missions because the M198 was too heavy. Although the M101A1 did not have the desired lethality and range, it provided the mobility needed by highly maneuverable ground forces in raid or rapid action scenarios. However, the weapon was only marginally supportable because of its age and maintainability. In light of this and new Department of Defense acquisition regulations, the Marine Corps replaced the Joint Service Operational Requirement of 1989 with an approved Mission Need Statement in May 1993 for a lightweight, towed 155-mm. howitzer to supplant the M198 and M101A1.[162]

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[160]Report, subj: Heavy Forces Modernization Plan, 1998, p. F1.

[161]1995 USAFACFS ACH, pp. 121-22.

[162]Ibid., pp. 122-23.

Given the common need for a lightweight towed 155-mm. howitzer, the Army and the Marine Corps joined forces. In October 1993 they signed a memorandum of agreement that outlined the system's desired characteristics. The howitzer would have a maximum weight of nine thousand pounds and a capability of firing rocket-assisted projectiles to a range of thirty kilometers. According to the memorandum, the Army would take the lead in defining the detailed requirements for the howitzer. This would be done through an early user-sponsored study to establish an analytical basis and cost effectiveness of the system, to evaluate the potential of existing lightweight 155-mm. howitzer prototypes that had been built by various contractors, and to explore labor-saving and tactical efficiencies possible through improved technologies. The study ultimately would lead to a refined, detailed statement of the joint requirement to allow the development of a Joint Operational Requirements Document.[163]

Meanwhile, the Field Artillery School wrote a draft Mission Need Statement for the Advanced Towed Cannon System, renamed the Lightweight 155-mm. Towed Howitzer in 1996 and XM777 in 1997, for the Army in 1993-94. Because the Army did not want a separate Mission Need Statement and because the Marine Corps Mission Need Statement adequately stated the basic requirements for the weight, range, and weapon capabilities that the Army needed, the U.S. Army Training and Doctrine Command (TRADOC) requested the U.S. Army Field Artillery School to explore endorsing the Marine Corps's Mission Need Statement or developing a joint Mission Need Statement with the Marine Corps.[164] Recognizing that the Marine Corps did not want to write a new Mission Need Statement and that the basic requirements for the howitzer were identical for both services, the Field Artillery School recommended in May 1994 that the Army should adopt the Marine Corps's Mission Need Statement to simplify acquiring a new towed howitzer and sent the Statement to TRADOC.[165]

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[163] Ibid., p. 123; 1997 USAFACFS ACH, p. 78.

[164] 1995 USAFACFS ACH, pp. 123-24; 1997 USAFACFS ACH, pp. 78-79.

[165] 1996 USAFACFS ACH, p. 124. See Memorandum for Cdr, TRADOC, subj: USAFAS Endorsement of the USMC Mission Need Statement for a Lightweight 155-mm Towed Howitzer, 3 May 94, Doc III-114, for additional information.

Upon approving the Statement in June 1994 after arriving at the same conclusions that the Field Artillery School had reached, TRADOC forwarded it to the Department of the Army. Based upon TRADOC's recommendation and a review of the Marine Corps's Mission Need Statement, the Department of the Army approved it for use in September 1994 and took the lead in developing the lightweight 155-mm. howitzer operational requirements document with support from the Marine Corps.[166]

Over the next eighteen months, key events with the system occurred. In February 1995 the Assistant Secretary of the Navy for Research, Development, and Acquisition approved moving the lightweight 155-mm. towed howitzer program into the Concept Exploration and Definition Phase and outlined the need for a shoot off between candidate 155-mm. systems. On 29 September 1995 the Army approved the Joint Operational Requirements Documents that outlined the system's characteristics. Five months later in February 1996, the Assistant Secretary of the Navy for Research, Development, and Acquisition sanctioned moving the program into the Engineering and Manufacturing Development phase (EMD).[167]

Although a joint program existed to produce a lightweight, towed 155-mm. howitzer for the Army and Marine Corps, one basic difference existed between the two services' objective system. Because the Marine Corps had an immediate requirement for a towed 155-mm. howitzer to replace the M198 and M101, it decided to field a howitzer without digital capabilities. The Army's lightweight 155-mm towed howitzer, in comparison, would be fully digitized and would be introduced later than the Marine Corps's. However, the Marine Corps planned to digitize their lightweight 155-mm. towed howitzer through product improvement programs subsequent to fielding.[168]

Although the biggest obstacles to digitization were weight restrictions, power requirements, and the need to harden the automated systems to withstand weather and operational conditions, technology solved the problems. In 1996 modern electronics made possible an onboard computer with an integrated radio modem and an onboard power supply. Linked with a single-channel ground and airborne radio system (SINCGARS), the computer would furnish rapid, secure communications to the fire direction center or platoon operations center and directly to target acquisition sources. Ultimately, the computer would improve responsiveness and increase accuracy, lethality, and survivability.[169]

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[166]Ibid., pp. 124-25.

[167]Ibid., p. 125; 1997 USAFACFS ACH, p. 79.

[168]1996 USAFACFS ACH, pp. 125-26.

[169]Ibid., p. 121.

In the meantime, the Joint Program Manager for the weapon system conducted a series of tests in 1996. Four contractors passed the initial screening criteria. They were Vickers Shipbuilding and Engineering Limited (VSEL), Royal Ordnance, Lockheed-Martin Defense Systems, and Lewis Machine and Tool Incorporated. In May 1996 Lewis Machine and Tool Incorporated was disqualified because its prototype had actually been constructed by a government arsenal. Subsequently, Lockheed-Martin Defense Systems dropped out of the tests because its prototype had too many technical difficulties to be competitive. By the time that testing had ended, only Vickers and Royal Ordnance remained in contention. For three months in 1996, B Battery, 3rd Battalion, 321st Field Artillery from Fort Bragg, North Carolina, and L Battery, 3rd Battalion, 11th Marine Regiment from Twenty Nine Palms, California, conducted operational testing.[170]

Based upon the test results and the ability to meet development time lines and costs, the U.S. Government awarded the contract to the team of Vickers and Textron Marine and Land Systems in 1997 with the latter being the prime contractor for engineering, manufacturing, and development to refine Vicker's ultra lightweight field howitzer prototype so that it could be massed produced by industry and be a suitable replacement for the M198 towed 155-mm. howitzer. Funded by the U.S. Marine Corps, the contract stipulated the delivery of eight nondigitized howitzers for operational testing in 1999. If the eight howitzers passed the tests conducted by the Marine Corps to ensure that the design satisfied the joint operational requirements, production of 526 nondigitized howitzers for the Marine Corps would begin with a first unit to be equipped in mid-2002. Retrofitting them with digitized capabilities would come later. Subsequently, the Army would receive 273 digitized howitzers in 2005.[171]

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[170]Ibid., pp. 121-22; Interview, Dastrup with John Yager, LW155 Project Manager, TSM Cannon, 10 Feb 99, Doc III-115; "New USMC Towed Howitzer," Field Artillery, Jul-Aug 98, p. 37, Doc III-116.

[171]1997 USAFACFS ACH, p. 80; Interview, Dastrup with John Yager, 10 Feb 99; "New USMC Towed Howitzer," p. 37.

In 1998 funding problems forced a revision of the lightweight 155-mm. howitzer contract and set back development a few months. Unable to continue work because it had run out of funding, Textron Marine and Land Systems requested in August 1998 to be relieved of its responsibilities as prime contractor. After lengthy legal discussions with Textron, the U.S. government agreed in September 1998 to accept the company's request and permitted Vickers to become the prime contractor to finish the remaining engineering and manufacturing development phase work. On 21 December 1998 Vickers officially announced that it had taken over as the prime contractor and was prepared to keep the project going through production.[172]

In the meantime, the Field Artillery School and the XVIII Airborne Corps at Fort Bragg, North Carolina, integrated a battery of towed 155-mm. automated howitzers in the Rapid Force Projection Initiative Advanced Concept Technology Demonstration (RFPI ACTD) at Fort Benning, Georgia, in July-August 1998.[173] They wanted to determine how much more effective and survivable the M198 with a Digital Fire Control System was than the standard M198. During the RFPI ACTD, C Battery, 1-377th Field Artillery, an XVIII Airborne Corps general support asset stationed at Fort Campbell, Kentucky, demonstrated the capabilities of the Digital Fire Control System through field exercises and simulation with encouraging results. Assessing the howitzer's performance, Lieutenant General William F. Kernan, Commanding General of the XVIII Airborne Corps, wrote, "During the conduct of the Rapid Force Projection Initiative Advanced Concept Technology Demonstration

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[172]Interview, Dastrup with John Yager, 10 Feb 99; Press Release, US Lightweight Howitzer Program Engineering and Manufacturing Development, 21 Dec 98, Doc III-117.

[173]Memorandum for Record, subj: Input from John Yager, LW155 Automated Howitzer Project Officer, TSM Cannon, 10 Feb 99, Doc III-118; Memorandum for Deputy Assistant Secretary of the Army for Research and Development, subj: USAFAS Support for the RFPI ACTD, 5 Jun 95, Doc III-119; Memorandum for John Yager, TSM Cannon, subj: SME Review of LW155 Portion of 1998 Annual Command History, 18 Feb 99, Doc III-120.

Field Experiment, the . . . Automated Howitzer appeared to have great potential."[174] The U.S. Army Operational Test and Evaluation Command shared the general's conclusion in a draft report of November 1998.[175]

FUTURE DIRECT SUPPORT WEAPON SYSTEM OR ADVANCED TECHNOLOGY LIGHT ARTILLERY SYSTEM

[174]Memorandum for Cdr, U.S. Army Forces Command, subj: Support for High Mobility Artillery Rocket System and Automated 155mm Howitzer Modernization for XVIII Airborne Corps, 9 Nov 98, Doc III-121.

[175]Report, subj: Assessment for the 155-mm. Automated Howitzer, RFPI ACTD, 18 Nov 98, pp. 1-1 - 2-1, Doc III-122; Interview, Dastrup with John Yager, 10 Feb 99; Fact Sheet, subj: 155-mm. Towed Artillery Digitization, Feb 99, Doc III-122A.

In 1996 the Field Artillery began exploring earnestly the elimination of all 105-mm. howitzers currently used as direct support weapons for the light and special purpose forces for several reasons. First, the 105-mm. howitzer had only two types of munitions that enhanced weapon range and lethality. These munitions included the recently produced rocket assisted projectile, the M913, and the recently type-classified dual-purpose improved conventional munition (DPICM), the M915. The munitions, however, lacked sufficient killing power and required large expenditures of ammunition to achieve the desired effect upon targets. Second, the 105-mm. howitzer offered little opportunity to improve its overall combat effectiveness, extended little or no growth potential as a weapons platform for the future battlefield, and would not satisfy Army XXI requirements. Third, the 155-mm. howitzer fired a far broader family of munitions that had much greater effectiveness when compared to the 105-mm. howitzer shell. Fourth, technology had advanced to the point where it was feasible to produce a 155-mm. direct support weapon weighing little more than the current 105-mm. direct support weapon, the M119A1 howitzer.[176]

In order to meet the need for a lightweight 155-mm. howitzer for direct support missions in light or special purpose forces, the Field Artillery School developed and staffed a mission need statement with industry and other government agencies at a Integrated Concept Team meeting. The U.S. Army Training and Doctrine Command (TRADOC) subsequently approved the mission need statement in November 1997 and forwarded it to the Department of the Army where it was assigned a Catalog of Approved Requirements Documents number. Funding was being addressed in the Program Objective Memorandum for Fiscal Year 2000-05.[177]

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[176]1997 USAFACFS ACH, p. 81.

[177]Ibid.; Msg, subj: ATLAS Input to Annual Command History, 17 Mar 99, Doc III-123.

The Field Artillery School explained that the expected light weight of the Advanced Technology Light Artillery System (ATLAS) 155-mm. howitzer was called, would be achieved by employing two complementary recoil management means. Renamed the Future Direct Support Weapon System (FDSWS) early in 1999, the system would employ soft recoil or fire out of battery technique. In the soft recoil application the howitzer moved forward to achieve forward velocity. As this was occurring, the weapon would be fired. The recoil energy generated by the departing projectile had to overcome the forward motion of the tube before the tube would begin its rearward motion. This technique, although it was not new, would dissipate up to fifty percent of the recoil force in just overcoming the forward movement of the tube. Also, the system was being considered for the integration of electrorheological fluid technology. Upon the application of an electrical charge, electrorheological fluids would change viscosity. The integration of electrorheological fluids would permit real time management (fine tuning) of the recoil force imparted to the cannon upon firing. Such management would occur in milliseconds because the application of electric charge to the fluid would change the viscosity instantaneously. These combined technologies would result in a weapon platform of five thousand pounds, which would be only eight hundred pounds heavier than the M119A1 howitzer.[178]

Late in 1998 and early 1999, further developments shaped the FDSWS/ATLAS program. In the fall of 1998, the Commandant of the Field Artillery School, Major General Leo J. Baxter, explained, "ATLAS will provide the lethality, strategic deployability, and operational and tactical mobility needed to defeat future threats across the spectrum of conflict."[179] The howitzer's light weight would make it ideal

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[178]1997 USAFACFS ACH, pp. 81-82; Msg, subj: ATLAS Input to Annual Command History, 17 Mar 99; Msg, subj: ATLAS Input to Annual Command History-Reply, 17 Mar 99, Doc III-124.

[179]MG Leo J. Baxter, "ATLAS: Close Support for Future Light Forces," Field Artillery, Sep-Oct 98, p. 1, Doc III-

for the light forces. Along this line General Baxter made a critical decision on 23 February 1999. He reaffirmed that the lightweight 155-mm. howitzer would replace the M198 towed 155-mm. howitzer and that FDSWS/ATLAS would be a direct support weapon for the light forces to replace the M119 towed 105-mm. howitzer. This effectively ended considering the FDSWS/ATLAS for a general support role. Equally important, the General deferred making a decision on the caliber size, pending a forthcoming analysis to determine the ideal caliber (105-mm. to 155-mm.), the range, and the other desired characteristics. This meant as of early 1999 that the caliber was undecided even though the mission was not.[180]

MULTIPLE-LAUNCH ROCKET SYSTEM

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[180]Baxter, "ATLAS: Close Support for Future Forces," p. 2; Interview, Dastrup with Steve Johnson, Project Manager, DCD, 23 Feb 99, Doc III-126; Msg, subj: ATLAS Input to Annual Command History, 17 Mar 99.

In 1998 improvement efforts with the Multiple-Launch Rocket System (MLRS) focused on enhancing the munitions to give them better range and precision and making the launcher more responsive. Although MLRS System performed well during Operation Desert Storm in 1991, its rockets and their submunitions raised serious concerns. During the war, many Iraqi artillery assets outranged their coalition counterparts, including MLRS. Also, the high dud rate of munitions, including MLRS submunitions, raised concerns about the safety of soldiers passing through impact areas. Together, the proliferation of rocket systems with ranges greater than MLRS and the unacceptable dud rate led to the requirement for an extended-range (ER) MLRS rocket with a range of forty-five kilometers and a lower submunition dud rate. Such a range would increase the commander's ability to influence the battlefield at depth and to fire across boundaries and simultaneously would improve the survivability of launcher crews.[181]

Between 1995 and 1998, the Army moved ahead with ER-MLRS developmental efforts. Although the self-destruct fuse was improved as indicated by tests in 1995 and although the required range was met, tests in 1996 disclosed that the dud rate was still too high. This caused the Army to develop a "get well plan" in April 1996 to enhance the self-destruct fuse and to conduct additional testing in 1997. Once the improved M85 dual-purpose improved convention munition grenade in the ER-MLRS rocket had demonstrated a reduced dud rate, the Army moved the rocket into low-rate initial production in 1997 with operational testing in Fiscal Year (FY) 1998 and fielding in FY 1999. Although the ER-MLRS successfully passed the several tests in 1998, funding constraints and the decision to transition to a guided MLRS rocket that would be more accurate limited production to less than five thousand rockets.[182]

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[181]1995 USAFACFS ACH, p. 126; Fact Sheet, subj: MLRS Rockets, 1998, Doc III-127.

[182]1996 USAFACFS ACH, p. 123; 1997 USAFACFS ACH, pp. 82-83; Fact Sheet, subj: ER-MLRS, Feb 99, Doc III-128; Fact Sheet, subj: MLRS Rockets, 1998.

As the Army worked to introduce the ER-MLRS, it decided to adopt an extended-range guided MLRS rocket that could be fired from M270A1/High Mobility Artillery Rocket System launchers. Writing in Army in September 1996, the Commandant of the Field Artillery School, Major General Randall L. Rigby, explained the reasoning behind the decision to introduce the guided MLRS rocket. In recent years the Army's ability to protect itself from long-distance attack had been eroded with the proliferation of long-range rocket and cannon systems. To counter this the U.S. Army Missile Command's Research, Development, and Engineering Center with support from industry initiated work on an extended-range guided rocket for the MLRS to replace ER-MLRS in the twenty-first century. Unlike the accuracy of the traditional free-flight MLRS rocket that degraded as the range to the target increased, the guided rocket's guidance system would provide consistent, improved accuracy from a minimum range of fifteen kilometers to a maximum of sixty to seventy kilometers, depending upon warhead weight and type of propellant, to attack area and point targets. This would give the MLRS an additional fifteen kilometer range beyond the ER-MLRS. Such a range would permit hitting more targets, would make the MLRS more survivable because it could be positioned farther from the target, would require fewer rockets to neutralize a target, would reduce logistical requirements, and would enhance the Army's ability to conduct precision strikes. Given the need for the rocket, the Army approved entry into Engineering and Manufacturing Development (EMD) in July 1998 and subsequently awarded a contract to Lockheed Martin Vought Systems for EMD in November 1998 with low-rate initial production to begin in 2002 based upon successful testing and with the first unit to be equipped in 2004. The guided MLRS rocket, moreover, would be complemented by the smart MLRS tactical rocket with a maximum range of sixty to seventy kilometers. The smart munition that would be effective against a wide variety of high-value targets to include counterfire, air defense sites, and maneuver elements and would replace MLRS SADARM and terminally guided warhead.[183]

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[183]1996 USAFACFS ACH, pp. 123-24; 1997 USAFACFS ACH, p. 83; Fact Sheet, subj: Guidance and Control for Guided MLRS Rocket, Feb 99, Doc III-129; Fact Sheet, subj: MLRS Rockets, 98; "International Partners Sign $121 million GMLRS Contract, MLRS Dispatch," Fourth Quarter 1998, p. 2, Doc III-130; Fact Sheet, subj: MLRS Rockets, 1998, Doc III-131; Fact Sheet, subj: MLRS Smart Tactical Rocket, 1998; "Guided MLRS Moving into EMD," MLRS Dispatch, Third Quarter 1998, p. 2, Doc III-132; Annual Report, Program Executive Officer Tactical Missiles, 1998, pp. 18-19, Doc III-133.

Meanwhile, the Army recognized the requirement to modernize the MLRS M270 launcher to meet the needs of the Army Tactical Missile System (ATACMS) Block IA that required the Global Positioning System (GPS) to be shot. In 1993 the Army determined that the ATACMS Block IA would receive its GPS initialization data directly from the launcher. Although the M270A1 MLRS launcher, scheduled for fielding in 2000, would have that capability, the Block IA missile would be introduced in 1998. In view of this, the Army decided to upgrade the existing M270 launcher by incorporating GPS navigation to create the Improved Positioning Determining System (IPDS) launcher that it could fire the ATACMS Block IA. As of 1998, funding existed to field twenty-nine IPDS launchers beginning in 1998 and continuing into 2003 when they would be retrofitted to M270A1 configuration (see following paragraph for more information). Ten IPDS launchers went to the C Battery, 6-37th Field Artillery in Korea, which received new equipment training in February 1998, and nineteen went to the 2-18th Field Artillery at Fort Sill, Oklahoma, which underwent new equipment training in March-May 1998.[184]

Around 2000 the Army intended to replace the basic M270 launcher that had been introduced early in the 1980s with the M270A1 that would be developed through two major upgrade programs. Initiated in 1992, the Improved Fire Control System (IFCS) would enhance fire control microcircuits by replacing obsolete, maintenance-intensive hardware and software, while the Improved Launcher Mechanical System (ILMS) that was begun in 1995 in response to the requirement to reduce the time to aim and load the launcher would decrease firing time by permitting the launcher to be elevated and traversed faster to give greatly improved responsiveness and survivability in conducting fire missions and reload operations. Together, the two improvement programs would provide the commander with the ability to fire the future MLRS Family of Munitions well into the next century and would increase launcher survivability. Besides incorporating more and faster processors and increased memory/storage capabilities to reduce fire mission processing time and to increase processing capacity dramatically, the M270A1 also would have the Global Positioning System (GPS) to enhance navigation.[185]

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[184]1997 USAFACFS ACH, pp. 83-84; "2-18th Certified on MLRS IPDS Use," MLRS Dispatch, Second Quarter 1998, p. 4, Doc III-134; Fact Sheet, subj: Improved Positioning Determining System Launcher, 1998, Doc III-135.

[185]1997 USAFACFS ACH, p. 84; Fact Sheet, subj: MLRS Launcher Improvements, 1998, Doc III-136; "M270A1 Production to Begin," MLRS Dispatch, Third Quarter 1998, p. 5, Doc III-132; Report (Summary), Director of Operational Testing and

Developmental work on the M270A1 launcher progressed well in 1998. Based upon successful testing of the Improved Fire Control System and Improved Launcher Mechanical System early in 1998 to demonstrate that deficiencies identified in 1997 testing had been fixed, the Program Executive Officer of Tactical Missiles, Brigadier General Willie Nance, approved moving into low-rate initial production of forty-five launchers on 28 May 1998 with a goal of conducting operational testing in September 1999 and fielding the launchers in the fourth quarter of FY 2000.[186]

HIGH MOBILITY ARTILLERY ROCKET SYSTEM

Evaluation, subj: MLRS M270A1 Launcher, 12 Feb 99, Doc III-137.

[186]Interview, Dastrup with CPT Richard P. Howard, TSM RAMS, 9 Feb 99, Doc III-138; Memorandum for Director, DCD, subj: Coordination of 1998 USAFACFS Annual Command History, 29 Mar 99, p. 234, Doc III-138A; Fact Sheet, subj: MLRS Launcher Improvements, 1998; "M270A1 Production to Begin," MLRS Dispatch, Third Quarter 1998, p. 5; Report (Summary), Director of Operational Testing and Evaluation, subj: MLRS M270A1 Launcher, 12 Feb 99.

Although the Army first envisioned the need for a light multiple rocket launcher system in the 1980s as it started to field more light divisions, efforts to introduce it increased in urgency in the 1990s. In a message in mid-September 1990, the Commanding General of the U.S. Army Training and Doctrine Command (TRADOC) wrote, "TRADOC support for the HIMARS [High Mobility Artillery Rocket System] program has not waned. Indeed recent world events [the crisis in the Persian Gulf] serve to highlight the need for such a capability. The HIMARS program will continue to receive full TRADOC support. . . ."[187]

Although HIMARS was well-received throughout the Army with a few exceptions and showed promise, budgetary problems stalled development. In 1991 the Army did not fund HIMARS in its Long-Range Research, Development, and Acquisition Plan because the payoff of fielding two battalions was not deemed worth the cost of a new start. The Operational Requirements Document (ORD) stated only a requirement for two battalions with three being desired, whereas Legal Mix VII, being conducted by the U.S. Army Field Artillery School, supported a requirement of four to six battalions based on the Army's need to respond to two major regional contingencies in rapid sequence. Notwithstanding the requirement for increased "capability and lethality of. . . early deploying forces," HIMARS lost funding in the Army's program objective memorandum in March 1992 because the small amount of funding marked the program as being inexecutable by budget managers in Headquarters, Department of the Army.[188]

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[187]1995 USAFACFS ACH, pp. 132-33. See 1994 USAFACFS, pp. 163-86 for an in-depth discussion of the development of HIMARS.

[188]Ibid., pp. 133-34.

As a part of the effort to obtain HIMARS, in the meantime, the Field Artillery School began working as early as the spring of 1992 to find funding to construct one or two prototypes. Prototypes would permit commanders and other Army officials to observe the system's capabilities firsthand and to erase any doubts about the necessity of funding it. Perceiving that the Department of Defense's Science and Technology Initiative (Thrust) Number Five, Advanced Land Combat, could be an avenue to begin HIMARS development and gain momentum with the program, the School looked to that source. However, Dr. Fenner Milton, the chairperson of Thrust Number Five, only authorized money ($4.2 million) in December 1992 for Fiscal Years (FY) 1994-1996 to develop technology that could feed into HIMARS because of its potential to provide a substantial warfighting capability to early deploying light forces. Notwithstanding this, the HIMARS program still lacked funding for prototype development because Dr. Milton only provided money for developing the technology that might be used in HIMARS and not for developing prototypes.[189]

The Field Artillery School's struggle to field HIMARS continued into the next year. On 24 February 1993 the Office of the Assistant Secretary of the Army for Research and Development wrote that Dr. Milton had expressed interest in working with the Field Artillery School. He wanted to reach an overall research and development strategy that supported HIMARS, that was affordable, and that could be justified.[190] In a subsequent telephone conversation with the Director of the Directorate of Combat Developments (DCD), U.S. Army Field Artillery School, on 5 March 1993, Dr. Milton reemphasized his support for HIMARS. With this, funding from Thrust 5 seemed possible for HIMARS prototypes, but it never came.[191]

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[189] Ibid.

[190] Ibid., pp. 134-35.

[191] Ibid., p. 135.

Meanwhile, the School pursued action with the U.S. Army Tank and Automotive Command, the U.S. Army Missile Command, the Program Manager of MLRS, and others to build a mockup HIMARS. This would permit collecting user input, maintaining visibility at high-profile events, and demonstrating the feasibility of the design. Equally important, the mockup could eventually lead to funding for prototypes.[192] Although funding for HIMARS remained critical during 1993, the mockup, which could be carried by a C-130 but could not fire, could elevate and traverse to fixed positions, and had a two-person crew, produced the desired results. At the Association of the United States Army convention in October 1993, the Chief of Staff of the Army, General Gordon R. Sullivan, expressed an interest in the mockup. Based upon successful mockup demonstrations, the Undersecretary of Defense and other Department of Defense agencies also expressed an interest in developing HIMARS prototypes. Even though high-level support existed, even though the Depth and Simultaneous and Attack Battle Lab at the Field Artillery School and the Joint Precision Strike Demonstration Task Force were working to obtain funds, and even though a test firing in December 1993 was successful, HIMARS still remained unfunded at the close of 1993.[193]

Although funding did not materialize in 1994, support for HIMARS continued to grow. In January 1994 the Field Artillery School shipped the HIMARS mockup to Fort Polk, Louisiana, for the light commander conference. Army commanders there "loved" HIMARS as did the Marines, who desired to display it at Twenty Nine Palms, California. As many in the Field Artillery School anticipated, the Marine Corps enthusiastically endorsed HIMARS. In fact, School participants at the March 1994 demonstration for the Marine Corps reported, "They [Marine Corps] were all impressed with the HIMARS."[194] Eight months later, the Army Chief of Staff expressed his support.[195]

Although the support failed to produce any funding at the end of 1994, Program Manager, Multiple-Launch Rocket System (MLRS) and the Rapid Force Projection Initiative (RFPI), a joint effort sponsored by MICOM and Dismounted Battle Space Battle Laboratory, Fort Benning, Georgia, signed a memorandum of agreement early in 1995 to build four HIMARS prototypes with RFPI putting $33 million towards rapid design, fielding, and experimentation in 1998. The RFPI, a multi-year effort, planned to conduct an Advanced Concepts Technology

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[192] Ibid.

[193] Ibid., pp. 135-36.

[194] Ibid., p. 136.

[195] Ibid., pp. 136-37.

Demonstration (ACTD) in 1998 using new target acquisition systems, "shooters," and command and control systems with the intent of transitioning mature technological solutions into significant operational capabilities to fill the gap created by aging forward-based equipment and the power projection strategy of forced or early entry operations. Through the ACTD the RFPI ultimately wanted to address the vulnerabilities of early entry forces during the initial days of a deployment and before the entrance of follow-on forces into the area of operations by increasing their lethality, survivability, and ability to control battle tempo. One of the new systems would be the four HIMARS prototypes. After the ACTD of the summer of 1998, the RFPI intended to leave three of the four HIMAR prototypes behind for the XVIII Airborne Corps to use and evaluate for approximately two years.[196]

[196]1997 USAFACFS ACH, pp. 91-92; Fact Sheet, subj: RFPI ACTD, Apr 98, Doc III-145.

In 1996 the HIMARS experienced mixed progress. Even though the Field Artillery School reaffirmed the requirement for HIMARS, the Army in July 1996 removed funding for the first two years of engineering and manufacturing development (EMD) from the FY 1998 Program Objective Memorandum. As TSM RAM explained, this produced a disconnect. Funded when the Army and the contractor signed a contract in February 1996, the four RPFI ACTD prototypes would be fielded late in 1998. User testing by the XVIII Airborne Corps would be completed about 2000. Without funding for engineering and manufacturing development of HIMARS, the Army slipped the start of development of the objective system to Fiscal Year (FY) 2004 and set the first unit equipped date in FY 2009. The lack of EMD funding, therefore, created a gap of several years between the end of user testing with the prototypes in FY 2000 and the first unit equipped date. As a result, the Field Artillery School feared the inability of incorporating lessons learned from the prototype testing into the development of the objective HIMARS system. Funding had to be restored to eliminate the gap and to minimize losing the lessons learned and contractors with development experience.[197]

The Army finally resolved the funding issue. With the availability of some funds, the Army decided in 1997 to initiate a maturation phase in 2001, modifications to HIMARS based upon the extended user evaluation, engineering and manufacturing development in 2000, procurement in 2004, and fielding in 2005. Because the system would add considerable fire support capability to early deploying light forces and because emerging force structure studies called for each of the two field artillery brigades in support of the light division to consist of two HIMARS battalions and one towed artillery battalion, the Army funded HIMARS in the POM. One year later in 1998 with funding stabilized, the Army designed a new fielding strategy. It moved the first unit equipped date to 2006 from 2004 to reduce the gap between the ACTD and extended users evaluation and fielding the system.[198]

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[197]1996 USAFACFS ACH, pp. 139-40; 1997 USAFACFS ACH, p. 92.

[198]1997 USAFACFS ACH, p. 92; CPT Jason W. Robbins, "HIMARS for Deployable 'Heavyweight' Fires," Field Artillery, May-Jun p. 33, Doc III-146; Fact Sheet, subj: MLRS Launcher Improvements, Apr 98, Doc III-147; Msg, subj: HIMARS, 14 Feb 99, Doc III-148; Msg, subj: HIMARS History, 12 Feb 99, Doc III-149.

Based upon HIMARS's successful showing in the RFPI ACTD of mid-1998, the Army, in the meantime, determined that the system should be retained, even though some technical problems precluded an unlimited "go-to-war" capability at the time, and should enter into the extended user evaluation phase as planned. The Army left three of the four HIMARS prototypes behind for the XVIII Airborne Corps to form a platoon of three HIMARS in the 3-27th Field Artillery to use for approximately two years beginning in October 1998. The fourth prototype would be shipped to Redstone Arsenal, Alabama, in the near future for electromagnetic radiation hazardous tests.[199]

ARMY TACTICAL MISSILE SYSTEM AND BRILLIANT ANTIARMOR SUBMUNITION

After several years of full-scale engineering and development in the 1980s, the Army introduced the Army Tactical Missile System (ATACMS) early in the 1990s to meet the pressing requirement of attacking second-echelon forces. Mounted on a Multiple-Launch Rocket System (MLRS) M270 launcher, ATACMS was designed to engage "soft" stationary targets (air defense units; command, control, and communications; surface-to-surface missile units; logistical sites; and helicopter forward operating bases) at ranges of 25 to 165 kilometers by dispensing bomblets over the target. In September 1990 the first ATACMS-capable unit was fielded in Southwest Asia because of Operation Desert Shield of 1990 and not to Germany where it was initially scheduled to go. As combat operations in Operation Desert Storm by A Battery, 6-27th Field Artillery, 75th Field Artillery Brigade demonstrated, ATACMS, later renamed ATACMS Block I as new versions were introduced, gave the Army its first real deep attack capabilities with a conventional weapon to support AirLand Battle. Ultimately, Lockheed Martin Vought Systems of Grand Prairie, Texas, produced approximately fifteen hundred missiles by FY 1997 to complete fielding.[200]

Operational considerations in 1991-92, in the meantime, raised the necessity of an extended-range ATACMS. Concerned about deficiencies in theater missile defense, the U.S. Army Strategic Defense Command tasked the U.S. Army Field Artillery School (USAFAS) to find solutions. In its Artillery Attack Operations Study, approved by the Commandant of USAFAS, Major General Fred F. Marty, in February 1993, the School determined that an extended range would improve ATACMS's operationally capabilities by allowing it to engage more

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[199]Ibid., p. 137; "HIMARS Fires First Rockets," MLRS Dispatch, Second Quarter 1998, p. 2, Doc III-134; Robbins, "HIMARS for Deployable "Heavyweight" Fires," p. 33; Msg, subj: HIMARS, 14 Feb 99.

[200]1997 USAFACFS ACH, pp. 84-85; Interview, Dastrup with MAJ Jay Hilliard, TSM RAMS, DCD, 5 Feb 99, Doc III-139.

targets at a deeper range.[201]

[201]1995 USAFACFS ACH, p. 130.

This conclusion dovetailed nicely with observations of Army officers. Based upon their experience in Operation Desert Storm in 1991, commanders, their staffs, and users also visualized the need for greater range for ATACMS. Some insisted that the existing range was inadequate and restricted the number of targets that could be engaged. With engineering changes the system could achieve twice or more the range of the current ATACMS Block I to give commanders more flexibility to attack deep targets, such as long-range, surface-to-surface missile launchers, to compensate for availability shortfalls of tactical air because of priorities, weather, and darkness, and to attack targets more quickly than tactical air could.[202]

Over the next several years, the Field Artillery School worked to introduce the Extended-Range ATACMS, renamed Improved ATACMS and finally ATACMS Block IA in 1994. During 1993, the School developed the requirements and documentation for the Army System Acquisition Review Council (ASARC) of February 1994 that would decide if the system could go into developmental engineering. Co-chaired by the Army Vice Chief of Staff and Military Deputy to the Assistant Secretary of the Army for Research, Development, and Acquisition, the ASARC reviewed the plans to extend ATACMS's range by reducing the payload and to incorporate Global Positioning System (GPS) navigational system. The council approved the plans in February 1994 and directed the program to proceed with engineering and development of the enhancements. When completely fielded, the ATACMS Block IA would have a range of seventy to three hundred kilometers and would carry approximately 300 anti-personnel, anti-material M74 bomblets to neutralize soft targets rather than the 950 carried in the ATACMS Block I. Increased accuracy of the ATACMS Block IA, produced by the GPS navigational system, would offset the reduction in number of bomblets and produce a greater range than ATACMS Block I.[203]

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[202]Ibid., pp. 130-31.

[203]Ibid., p. 130; Fact Sheet, subj: ATACMS, 1998, Doc III-140; Interview, Dastrup with Hilliard, 5 Feb 99; Report (Summary), Director of Operational Testing and Evaluation, subj: ATACMS Block IA, 12 Feb 99, Doc III-141.

Development continued in 1996-97. In 1996 the Army conducted test firings of ATACMS Block IA at White Sands Missile Range, New Mexico. Test firings from III Corps Artillery crews demonstrated the system's ability to accept digital fire missions from a Joint Surveillance and Target Attack Radar System (JSTARS) and Ground Station Module (GSM). Although all of the testing was not completed, initial successful firings prompted the Program Executive Officer, Tactical Missiles on 21 May 1996 to approve a low-rate initial production to begin in September 1996. However, reliability concerns brought up early in 1997 caused the Gilbert F. Decker, the Army Acquisition Executive, to retain the system in low-rate initial production in 1997 to permit the Army to address effectiveness and reliability issues. Subsequent testing in 1997 justified a full-scale production decision by the Army in February 1998 with production to run about four years. Funding levels as of 1998 would introduce 652 ATACMS Block IA missiles.[204]

In the meantime, difficulties with another missile led to significant modifications in the ATACMS program. In 1984 the Army started development on a brilliant antiarmor submunition (BAT) as part of a larger combat development program, the Tri-Service Standoff Attack Missile (TSSAM). TSSAM was a joint program to develop a stand-off cruise missile that would employ low-observable (stealth) technology to enhance survivability with the Army version being launched from the Multiple-Launch Rocket System (MLRS) launcher. Meanwhile, BAT was designed to employ acoustic and infrared seekers to acquire, classify, and destroy moving armored combat vehicles deep within enemy territory (one hundred kilometers or more). BAT would have allocation logic to minimize the possibility of multiple BATs engaging a single vehicle and a large acquisition footprint to locate targets within four kilometers of the dispense point. Equally important, the Army designated TSSAM as the primary system to deliver BAT with ATACMS Block II being the secondary choice if TSSAM development should slip any more or be cut because of budget reductions.[205]

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[204]1997 USAFACFS ACH, pp. 85-86; Interview, Dastrup with Hilliard, 5 Feb 99; Fact Sheet, subj: ATACMS, 1998; Fact Sheet, subj: ATACMS, 1999, Doc III-142; Memorandum for Record, subj: Annual History Input from MAJ Jay Hilliard, TSM RAMS, 24 Feb 99, Doc III-143.

[205]Report (Summary), Director of Operational Testing and Evaluation, subj: ATACMS Block II/BAT, 12 Feb 99, Doc III-144; 1995 USAFACFS ACH, pp. 108-09.

Although ATACMS could carry BAT, the Army preferred TSSAM. The latter depended upon stealth technology to evade detection and had the ability of delivering more BAT submunitions than ATACMS Block II could (twenty-two versus thirteen). Because ATACMS Block II would fly almost three times faster than TSSAM, it gave the target less time to move after the missile had been fired and to evade being hit. Although the cost-per-kill with both, TSSAM and ATACMS Block II, was almost equal, integrating BAT with ATACMS Block II would be difficult. To dispense more BAT submunitions, ATACMS Block II would require a much blunter nose, which would make it less aerodynamic. Also, experts had to solve the problem of dispensing submunitions from ATACMS Block II over the target because the missile would be traveling at supersonic speeds when it released its submunitions. Regardless of the carrier missile, BAT would enable the Army to attrit enemy armored combat vehicles at great depth and "meter the flow" to make the close battle more manageable.[206]

In November 1993 the option of using TSSAM as a BAT carrier lost its attractiveness, forcing changes in priorities. Because of test failures and the increasing cost of the missile, the Army obtained permission from the Office of the Secretary of Defense to pull out of the TSSAM developmental effort. This left ATACMS Block II as the carrier missile and meant, at least for the time being, that the Army had to find a way to dispense BAT from a fast-moving missile. Interestingly, the decision to pull out of the TSSAM program had a negative impact. By coming so late in 1993, the decision prevented the Army from funding ATACMS Block II as a carrier for BAT in Fiscal Year (FY) 1994. As a result, fielding BAT was set back three years from 1998 to 2001.[207]

In the meantime, at the request of Congress in 1992, the General Accounting Office gathered information on the BAT program. Specifically, it examined the reasonableness of BAT cost estimates, the Cost and Operational Effectiveness Analysis's support for BAT development, and the Army's plans to demonstrate operational effectiveness prior to low-rate initial production approval. Besides pointing out that costs were escalating, the General Accounting Office indicated in a draft report of late 1993 that there was no way to conduct a full BAT operational test because of safety and other constraints. Because the Army received the draft report in January 1994, nothing had been done in 1993 to address the above concerns.[208]

In 1994 a controversy between the Directorate of Operational Tests and Evaluation, a Department of Defense agency, and the Army arose over the operational tests of BAT. Picking up where the General Accounting Office left off, the Directorate of Operational Tests and Evaluation wanted the Army to fire two fully operational ATACMS Block II missiles with BAT warheads (twenty-six submunitions) to determine if they worked properly. In contrast, the Army wanted to fire only the number of warheads required to prove that BAT worked because it did not have sufficient numbers of threat vehicles to justify using two BAT warheads.[209]

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[206]Ibid., p. 109.

[207]Ibid., p. 109-10.

[208]Ibid., pp. 110-11; 1997 USAFACFS ACH, pp. 87-88.

[209]1995 USAFACFS ACH, p. 111.

Held in 1994, design verification tests significantly reduced the concerns with BAT. In the initial test the Army dropped two BATs from an airborne aircraft to validate hardware design. Both hit their respective targets. Minor problems, however, in a subsequent test in 1995 caused BAT to fail and miss the target. This influenced the Army to delay testing while additional engineering changes were made. BAT drop testing from aircraft resumed in 1996 and produced several successful engagements. On 16 October 1997 a flight test occurred in which BAT submunitions were successfully dispensed from the carrier for the first time. Based upon this and other successful flight tests, the ASARC of December 1998 decided to go into low-rate initial production with ATACMS Block II BAT and prepared for the Defense Acquisition Board of February 1999 because the Department of Defense had oversight responsibilities for the missile.[210]

Although the original justification -- the Soviet and Warsaw Pact threat -- had disappeared with the end of the Cold War, the requirement for BAT still existed. In 1994 the Army explained, "The greatest potential threat to US Forces is that posed by armored and motorized forces. These highly mobile armored maneuver forces, supported by armed helicopters, are expected to pursue battlefield objectives using numerical force superiority, speed, and penetration."[211] The Army also noted that it had an inadequate capability to attack armored vehicles and surface-to-surface missile launchers beyond the range of close combat weapons. In addition, the Army had the urgent need for an autonomous, terminal homing submunition to defeat moving and stationary targets in the second echelon of the threat array.[212]

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[210]1997 USAFACFS ACH, p. 88; Interview, Dastrup with Hilliard, 5 Feb 99; Memorandum for Record, subj: Annual History Input from MAJ Jay Hilliard, TSM RAMS, 24 Feb 99.

[211]1995 USAFACFS ACH, p. 112.

[212]Ibid.

In view of the requirement to attack stationary armored vehicles and surface-to-surface missile (SSM) transporters, erectors, and launchers (TELS), the Army visualized the need for improving the BAT. The BAT Pre-Planned Product Improvement (P3I) would have the capabilities of attacking moving armor, stationary armor, hot or cold armor, SSM TELS, and heavy multiple rocket launchers and would be more resistant to weather and countermeasures. Carrying six BAT submunitions rather than thirteen as the ATACMS II would, ATACMS Block IIA would have a range of one hundred to three hundred kilometers and would use a global positioning system (GPS) augmented guidance system that was similar to the one in the ATACMS IA and ATACMS II to improve accuracy. As planned in 1997 and 1998, the BAT P3I would also be fielded in the remaining ATACMS Block II missiles in FY 2004 rather than BAT. ATACMS Block IIA with BAT P3I would also have an initial operational capability of FY 2005.[213]

FIREFINDER RADARS

Because of the growing threat of counterfire from hostile fire support systems, the Army initiated action in 1984 to improve its AN/TPQ-36 and AN/TPQ-37 radars. The Army considered these radars to be too large and heavy for AirLand Battle and for use with the light forces that were being developed. Through product improvements the Army planned to field a mobile, survivable Firefinder radar to replace the Q-36 and Q-37 radars in the target acquisition battery. To do this, the Army created a block improvement program in 1985-86 to integrate existing Firefinder radars into a single follow-on system that would be based on the Q-36. Ongoing improvements to the Q-36 became Block I. Block II outlined incorporating crew reduction and self-leveling of the Q-36 radar and placing it on a five-ton truck, while Block III would add electronic improvements to the Q-36 radar late in the 1990s. Fielded on either a five-ton truck or track vehicle for the heavy division or a High Mobility Multipurpose Wheeled Vehicle (HMMWV) for the light forces, the Q-36 Block III radar would provide highly mobile and light target acquisition support. Because of the radar's configuration, the crew could rapidly occupy positions, detect targets up to thirty-six kilometers in range, and then quickly displace for better survivability.[214]

In 1987 the U.S. Army Field Artillery School split the Q-36 Block II program into Block IIA and Block IIB. With Block IIA the School outlined reducing the size of the Q-36 to fit on a five-ton truck to permit the crew to emplace the radar in fourteen minutes and

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[213]1997 USAFACFS ACH, p. 89; Fact Sheet, subj: ATACMS, Feb 99; Fact Sheet, subj: ATACMS, 1998; Interview, Dastrup with Hilliard, 5 Feb 99; Memorandum for Record, subj: Annual History Input from MAJ Jay Hilliard, TSM RAMS, 24 Feb 99.

[214]1996 USAFACFS Annual Historical Review, p. 90.

displace it in five minutes and provide target acquisition for heavy divisions. In comparison, Q-36 Block IIB improvements focused on placing the radar on a trailer and towing it with a HMMWV to support the light forces. Block IIB would also reduce the number of vehicles required to transport the system and enhance strategic deployability.[215]

[215]1995 USAFACFS ACH, pp. 138-39.

In view of the Army's shift from forward-deployed forces in Europe to power projection from the continental United States after the Cold War ended, the Commandant of the Field Artillery School, Major General Raphael J. Hallada (1987-1991), eliminated the Q-36 Block IIA early in the 1990s and placed priority and all funds into Block IIB. The Army then divided Block IIB into two phases or versions that would improve the survivability, mobility, and capability of the Q-36. In phase one (Q-36 version 7/HMMWV) the operations control group would be mounted on an M1097 HMMWV that would tow the M116A2 cargo trailer. The second M1097 HMMWV would carry an MEP 112A generator and tow the Antenna Transceiver Group that would be mounted on a modified M116A2 trailer. The M998 HMMWV reconnaissance vehicle would pull a second M116A2 trailer that would have an additional MEP112A generator. This would improve the radar's transportability and mobility and produce a radar that could support both light and heavy forces.[216]

Subsequent to these improvements, the Army planned to upgrade the Q-36 through electronics enhancements in phase two (Q-36 version 8). Besides being the first major pre-planned product improvement to the radar to prevent system obsolescence and decrease maintenance requirements, the electronics upgrade would eliminate the S-250 shelter and provide a flat panel display/control unit mounted in a Lightweight Multi-Purpose Shelter. The upgrade would also incorporate a new high-speed signal processor to furnish faster access to data (fifty to one hundred targets per minute), would increase memory and digital map storage, and would reduce maintenance and shelter space requirements. Additionally, the upgrade would increase detection ranges for mortars and field artillery from twelve kilometers to eighteen kilometers, allow remote operations up to one hundred meters from the shelter, provide weapon type identification, reduce the incidence of false targets, and enhance the probability of location.[217]

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[216]Ibid., p. 139.

[217]Ibid., pp. 139-40.

Work on the Q-36 version seven and Q-36 version eight produced viable results by 1994. Each active division artillery would receive three radars, while each active separate maneuver brigade would get one. Initial fieldings of the Q-36 version seven radar began late in 1993 and were completed in July 1994. Because of delays in contract awards for long-lead items, however, the Army fielded the radars without the Modular Azimuth Positioning System (MAPS). This required retrofitting these Q-36s with MAPS between August 1994 and July 1995. This action completed the fielding of the Q-36 version seven. Meanwhile, low-rate initial production for Q-36 version eight radars started in December 1993 with a successful initial operational test and evaluation (IOTE) of February 1996. In response, the Army awarded a production contract for the electronic upgrade to Northrup-Grumman on 19 August 1996 for eleven Q-36 version eight systems for delivery in 1998.[218]

In 1998 the Q-36 version eight system ran into problems that stalled fielding. Although the Program Manager for Firefinder and the Director of the Directorate of Combat Developments in the Field Artillery School understood that the radar had difficulties detecting volley fire, they agreed on 14 July 1998 to a conditional release pending the correction of the shortfall by the contractor as quickly as possible. At the same time they agreed to waive the false location requirement of one per six hours to one per three hours to provide some relief to the contractor. Subsequently, the Army fielded a total of six radars to three units during the last three months of 1998. Initial reports from the units, however, confirmed an excessive false location rate that exceeded the one per three hours and frequent system lock-up problems that hampered operations, even though detecting volley fire had improved.[219] Yet, the improved ability to detect

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[218]1996 USAFACFS ACH, pp. 143-44; 1997 USAFACFS ACH, p. 94; Memorandum for Record, subj: SME Comments on Firefinder Radars, 24 Feb 99, Doc III-149A.

[219]Interview, Dastrup with Ron Anderson, FF Program Manager, DCD, USAFAS, 17 Feb 99, Doc III-150; Memorandum for AC, USAFAS, subj: AN/TPQ-36(V)8 Fielding Concerns, 22 Dec 98, Doc III-151; Memorandum for Deputy Chief of Staff for Operations and Plans, subj: Suspension of Q36(V)8 Fielding, 4 Jan 99, Doc III-152; Memorandum for BG Dean R. Ertwine, Deputy for Systems Acquisition US Army Communications-Electronic Command, subj: AN/TPQ-36(V)8 Fielding Concerns,

volley fire failed to satisfy the requirement and along with the other deficiencies suggested that version eight was not better than version seven as anticipated and that version eight was not operational and "a go to war system."[220] The false target detections, system lockups, and volley fire requirements had to be corrected before unconditional fielding.[221] As a result, the Army suspended fielding until the software deficiencies could be fixed.[222]

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23 Dec 98, Doc III-153.

[220]Memorandum for BG Dean R. Ertwine, subj: AN/TPQ-36(8) Fielding Concerns, 23 Dec 98.

[221]Ibid.

[222]Memorandum for BG Dean R. Ertwine, subj: Suspension of Q36(V)8 Fielding, 7 Jan 99, Doc III-154; Interview, Dastrup with Anderson, 17 Feb 99.

In the meantime, the Field Artillery School introduced another change to its counterfire radar system modernization program in 1990. Because the existing Firefinder Q-37 radar lacked the range, survivability, mobility, and target processing and identification capability to support future requirements and because the Q-36 modernization effort would not meet all of the Field Artillery's radar requirements as initially planned, the School identified the need for the Advanced Target Acquisition Counterfire System (ATACS) to replace the Q-37. The Q-37, which was 1970s radar technology, was obsolete and vulnerable to enemy radar, radio intercept, and locating and jamming systems. The Advanced Target Acquisition Counterfire System would take advantage of leap-ahead technology to give the Army a passive system or, at a minimum, passive or active cuing, would reduce the equipment and manpower needs significantly, and would furnish support to the corps area of influence in AirLand Operations. In addition, it would be capable of driving on and off a C-130 and larger aircraft and air insertion by CH-47D and would reduce crew size from twelve to six.[223]

In 1991 three alternatives existed to satisfy the Advanced Target Acquisition Counterfire System requirement. First, the Army could start a new research and development program. Second, it could introduce material changes to the existing Q-37 that would be less expensive than a new start. Third, the Army could negotiate a memorandum of understanding with France, the Federal Republic of Germany, and the United Kingdom to enter the European Counterbattery Radar (Cobra) program. Of the three possibilities, the last was the least expensive and most promising. In view of this, the Army opened negotiations with the Europeans in August 1991 to participate in their program, but it lacked funding to proceed beyond this point with Cobra. Later in 1992, the Army withdrew entirely because Cobra was becoming too expensive and large and did not meet the Field Artillery's requirements.[224]

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[223]1995 USAFACFS ACH, pp. 141-42.

[224]Ibid., p. 142.

In 1993-94 the Army chose to upgrade the existing Q-37 to meet its requirements for target acquisition because it was less expensive than a new start. As of 1994, the Enhanced Firefinder AN/TPQ-37 (Block I) program and the Firefinder AN/TPQ-37 Pre-planned Product Improvement (Block II) program existed. Basically, the Q-37 Block I represented an upgrade to the existing Q-37. Enhancements would include improved transportability, better mobility, and the incorporation of MAPS. The reliability, availability, and maintainability of the system would be upgraded through hardware and software improvements. After successful testing was completed at the Yuma Proving Ground, Arizona, production of twenty-six modification kits began in 1995. During the following year, the Army began fielding the Q-37 Block I radar to the active force. Funding, however, limited fielding to twenty-six systems through 1997. This meant that only part of the active force would have the Q-37 Block I radar. The rest were left with the original Q-37 until more funding could be obtained.[225]

The Advanced Target Acquisition Counterfire Radar, renamed Advanced Firefinder System in 1992, the AN/TPQ-37 Firefinder Pre-planned Product Improvement P3I Block II in 1994, the AN/TPQ-37 Block II in 1996, and the AN/TPQ-47 in 1998, offered significant improvements over the existing Q-37. Utilizing advanced technology, the Q-37 Block II would provide rapid and increased target location, improved accuracy, and enhanced target classification at greater ranges. At the same time it would significantly reduce equipment and manpower requirements and improve transportability, maintainability, and reliability for increased effectiveness on the battlefield. Besides this, it would furnish support to the entire corps area of influence with enhanced target processing and multiple friendly fire capability. Although research and development funding would not be available until Fiscal Year 1997, the U.S. Army Training and Doctrine Command (TRADOC) approved the operational requirements document, written by the Field Artillery School, in August 1995. Subsequently, the Department of the Army approved the requirements document in September 1996, and the request for proposal went out to private industry in the fall of 1997 with a contract for three prototypes being awarded to Raytheon in July 1998. Ultimately, the Q-47, would replace all Q-37s, including the Q-37 Block I, on a one-for-one basis.[226]

THE BRADLEY FIRE SUPPORT VEHICLE AND STRIKER

In 1997 the U.S. Army Field Artillery School (USAFAS) continued working on fielding the Bradley Fire Support Vehicle (BFIST) that was scheduled to be the successor to the M981 Fire Support Vehicle (FISTV). Late in the 1970s, a U.S. Army Training and Doctrine Command (TRADOC) working group, Close Support Study Group (CSSG) II, met to optimize observed fire support for the maneuver forces. Besides reaffirming the necessity of the Fire Support Team (FIST) that had been created in the mid-1970s to integrate fire support with the maneuver arms at the company level, the group recommended fielding a mobile fire support vehicle to provide reliable, secure communications.[227]

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[225]Ibid., pp. 142-43; 1997 USAFACFS ACH, p. 95.

[226]1996 USAFACFS ACH, pp. 146-47; 1997 USAFACFS ACH, p. 96; Interview, Dastrup with Ron Anderson, Firefinder Project Manager, DCD, 17 Feb 99.

[227]1995 USAFACFS ACH, p. 144.

In its drive to ensure effective fire support, CSSG II also considered alternatives to the improved M113 armored personnel carrier that had been designated as the FIST vehicle in the mid-1970s. The first option involved employing the XM2 infantry fighting vehicle/the XM3 cavalry fighting vehicle family of vehicles. Either vehicle offered greater mobility and survivability than the M113 and even the newer M981. The cavalry fighting vehicle was a derivation of the infantry fighting vehicle with minor interior modifications for crew size, additional ammunition, and equipment storage and did not have the fire port and associated weapons. Second, the Field Artillery could readily adopt the M981. After examining the options, the study group recommended fielding the M981 as the Field Artillery's fire support vehicle, retaining the M113, and using both vehicles as interim solutions until the XM2/XM3 (Bradley Fighting Vehicle) modified for fire support missions and called the BFIST could be introduced as the long-term solution.[228]

CSSG II did not heartily endorse the M113 or M981 as the fire support vehicle for several reasons. Early in the 1980s, the Army would be fielding the XM1 (Abrams) tank and the XM2/XM3, which would provide significant mobility and survivability over the M113 and M981. According to doctrine, the fire support vehicle required mobility and survivability equal to the supported force. Only XM2/XM3 vehicles modified as a BFIST could furnish the requisite mobility and survivability. In the meantime, the Field Artillery would have to employ M113s and M981s until sufficient numbers of XM2s/XM3s were available for fire support, which meant compromising effective close support for the maneuver arms.[229]

Operation Desert Storm (ODS) of 1991, however, highlighted the deficiencies of the M981 and reaffirmed the need for the BFIST. During the war, mobility and sustainability problems hampered the FIST's ability to keep pace with the maneuver forces that were equipped with the Abrams tank and the Bradley fighting vehicle. Also, the M981 lacked self-protection against armored threats and presented a unique signature that made it easy to identify as a fire support vehicle, causing it to be an attractive and vulnerable target for hostile fire. In addition, infantry and armor units did not stock sufficient spare parts for the M981 because it was a low-density vehicle.[230]

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[228]Ibid., pp. 144-45.

[229]Ibid., pp. 145-46.

[230]Ibid., p. 146; 1996 USAFACFS ACH, p. 149; 1997 USAFACFS ACH, p. 97; Army Heavy Force Modernization Plan (Extract), p. D-1, Doc III-106.

After funding became available early in the 1990s and after the maneuver arms got their Bradley fighting vehicles, equipping the Field Artillery with the BFIST became a reality and promised to solve the problems created by the M981. Outlined in the Operational Requirements Document approved by TRADOC in September 1994, the BFIST would have mobility comparable to the supported force, use common repair parts, and present a common signature with the supported force. Besides having a 25-mm. chain gun, the BFIST would also have a second-generation forward looking infrared (FLIR) and digitization.[231]

In 1995-96 combat and materiel developers envisioned two models of BFIST: the M7 and M7A1. The first version involved retrofitting a FIST mission package onto a Bradley A2 ODS chassis. The FIST mission package included laser designator, ring laser gyroscope, forward entry device, lightweight computer unit, and associated components to process digital information. The BFIST A2 ODS also would have an eye-safe laser rangefinder, a global positioning system, a driver's thermal viewer, and a battlefield combat identification system (when it became available) to reduce the probability of fratricide. With a scheduled fielding of 2004, the BFIST M7A1 would be more advanced, incorporate a Bradley A3 chassis with the FIST mission package, add a core electronic architecture to process messages on the digitized battlefield, and have two second-generation FLIR sights, one for the gunner and an independent sight for the commander. The second-generation FLIR would double the combat identification range of the first-generation FLIR to reduce the probability of fratricide, while full digitization would enable combat forces to move, set, attack, move/regenerate, and attack in a continuous cycle.[232]

Although critical milestone decisions were not made in 1996, work on the BFIST moved forward. On 1 October 1996 the contractor, United Defense Partnership, delivered four prototype BFISTs to the Army for testing. During January-October 1997, technical testing conducted at the Aberdeen Proving Ground, Maryland, focused on system reliability and maintainability, fire support team mission equipment performance, and system integration. Overall, the testing demonstrated that all critical system design characteristics had been met.[233]

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[231]1995 USAFACFS ACH, pp. 146-47; 1997 USAFACFS ACH, pp. 97-98.

[232]1996 USAFACFS ACH, p. 150.

[233]Ibid., p. 151; 1997 USAFACFS ACH, p. 98.

Subsequently, the Army made several critical decisions about the BFIST in 1997-98 that shaped the program. In May-June 1997 the Army conducted limited user testing. Using soldiers from the 3rd Infantry Division and placing the BFIST in an operational environment at Fort Sill, Oklahoma, where it functioned as a fire support vehicle for the first time, the Army encountered software problems that restricted the vehicle's ability to perform its mission as desired. Because the vehicle's overall performance met the requirements during the user test and because the system satisfied design characteristics during the technical testing of early 1997, the Army moved the BFIST into low-rate initial production with the objective of having an initial test and development evaluation completed in 1999. Subsequently late in 1998, the Army's Heavy Force Modernization Plan announced that the M7 would go to all heavy brigades and that the more advanced M7A1 would be fielded to the modernized heavy digitized brigades.[234]

[234]1997 USAFACFS ACH, pp. 98-99; Interview, Dastrup with Rick Dies, Dep Dir, Material Requirements and Integration (MRI), DCD, and MAJ Ron Todd, MRI, 2 Mar 99, Doc III-155; Army Heavy Force Modernization Plan, 1998, p. D-2; Memorandum for Director, DCD, subj: Coordination of 1998 USAFACFS Annual Command History, 29 Mar 99, p. 264, Doc III-138A.

Meanwhile, the Combat Observation Lasing Team (COLT) employed the M981 fire support vehicle. Besides lacking mobility and stealth, the M981 had been designed for armored and mechanized forces and presented a unique signature in the light forces that used High Mobility Multipurpose Wheeled Vehicles (HMMWVs) as their scout vehicles. In response to this discrepancy, TRADOC approved a change to the BFIST Operational Requirements Document in April 1997, written by the Field Artillery School, to leverage fire support vehicle technology for heavy and light forces. In the Operational Requirements Document the Field Artillery School retained the BFIST for the heavy forces and urged developing a vehicle with BFIST mission capabilities for the COLTS by integrating BFIST mission equipment package onto a HMMWV chassis, known as the Striker, to provide heavy and light force COLTS with unprecedented mobility, flexibility, and stealth to replace the M981. Also, for the light forces the Striker would be less noticeable because it would be like the other scout vehicles, would present a common signature, would save Bradley assets for fire support teams, and would lower operating costs for COLTs. Based upon its performance in the Task Force XXI Advanced Warfighting Experiment of March 1997, the Striker vehicle as well as the Striker concept that furnished six Striker vehicles to each field artillery brigade to operate in pairs for continuous operations and security was adopted by the U.S. Army as a Warfighting Rapid Acquisition Program (WRAP) by the Chief of Staff of the Army on 14 May 1997. This meant development and fielding would be accelerated.[235]

In July through October 1998 the Army conducted customer testing on a prototype Striker vehicle at the Yuma Proving Ground, Arizona, that was completed as a result of WRAP. Although testing revealed daytime vision to be good, nighttime vision failed to meet the requirements. Equipped with a Ground/Vehicle Laser Locator Designator (G/VLLD) with a first-generation Forward-Looking Infrared (FLIR) thermal night sight, the Striker lacked the ability to see far enough in the dark during the testing. Even so, the Army approved low-rate initial production in September 1998 with the caveat that the FLIR's range would be extended to meet the requirement and scheduled the first major test in the second quarter of FY 2000.[236]

EYES FOR LIGHT FIGHTERS: THE LIGHTWEIGHT LASER DESIGNATOR RANGEFINDER AND GUNLAYING AND POSITIONING SYSTEM

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[235]Ibid., p. 265; 1997 USAFACFS ACH, p. 99.

[236]Interview, Dastrup with Rick Dies, Dep Dir, Material Requirements and Integration (MRI), DCD, and MAJ Ron Todd, MRI, 2 Mar 99; Memorandum for Director, DCD, subj: Coordination of 1998 USAFACFS Annual Command History, 29 Mar 99, p. 266.

Early in the 1990s, light fire supporters employed the Ground/Vehicular Laser Locator Designator (G/VLLD) to lase targets for precision-guided munitions. The system weighed 107 pounds, along with other essential equipment reduced the mobility of the light fire support team, and did not meet its needs. In response to this situation and the lack of a man portable system to designate targets, the U.S. Army Field Artillery School wrote an Operational Requirements Document that was approved in February 1994 by the U.S. Army Training and Doctrine Command (TRADOC) to replace the G/VLLD with the Lightweight Laser Designator Rangefinder (LLDR). Although the LLDR remained unfunded for several years, the School still pursued it. Combining the latest technological advances in position/navigation (Precision Lightweight Global Positioning System), thermal sights, and laser development, the LLDR was a lightweight, compact, man-portable system designed for dismounted or mounted operations. Besides determining range, azimuth, and vertical angle, the LLDR would permit light forces to perform fire support functions quickly and accurately on a fast-paced, less dense, and more lethal battlefield and offered the best alternative to the G/VLLD. Because of its modular design, it could be readily tailored to the mission. In its target location configuration the LLDR weighed about twenty pounds and had the ability of locating targets accurately out to ten kilometers and seeing the battlefield with a near, all-weather capability. An integrated thermal night-sight provided continuous day/night operations and the ability to see through obscurants, such as fog and smoke. If needed, the LLDR could be configured with a separate laser designator module to paint moving and stationary targets to be engaged by precision munitions. This configuration caused the system to weigh thirty-five pounds. Equally important, the LLDR could be used in training environments because it had an eye-safe rangefinder but not an eye-safe designator.[237]

In 1996-97 the situation with the LLDR changed dramatically. Recognizing the need for such a piece of equipment, Program Manager for Nightvision in 1996 funded the LLDR through the end of engineering and manufacturing development. Subsequently, the Field Artillery School made the system an initiative of the Task Force XXI Advanced Warfighting Experiment of March 1997. During the experiment, the surrogate LLDR performed well and was subsequently approved as a Warfighting Rapid Acquisition Program (WRAP) in April 1997. This designation would accelerate fielding to the light forces and integration onto the Striker. As a final design review of June 1998 indicated, the LLDR satisfied the requirements, and work on a baseline production model began during the latter months of 1998. Additionally, funding was approved to pursue development of a longer range variant that could meet the Striker's thermal range requirements.[238]

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[237]1997 USAFACFS ACH, pp. 99-100.

[238]Memorandum for Director, DCD, subj: Coordination of 1998 USAFACFS Annual Command History, 29 Mar 99, p. 268; Interview, Dastrup with Dies and Todd, 2 Mar 99.

As work was moving forward with LLDR, the Field Artillery School took steps to acquire the Gun Laying and Positioning System (GLPS). For years the field artillery battalion provided survey. This meant that towed howitzer batteries and M109A5 155-mm. self-propelled howitzer batteries had to wait for conventional survey to be furnished by the battalion, which was time consuming and inefficient, in order to furnish accurate fires. In light of this, the Field Artillery School wrote an Operation Requirements Document that was approved by TRADOC in July 1993 for the GLPS. The system would be a tripod-mounted positioning and orienting device that consisted of a gyroscope, an electronic theodolite, an eye-safe laser rangefinder, and a Precision Lightweight Global Position System Receiver and that would give the battery autonomous positioning and directional capability. Lightweight and mobile, the GLPS established an orienting station, allowed the battery commander to position and orient his howitzers accurately and rapidly, and permitted retaining the unreliable and old Positioning and Azimuth Determining System in reserve as a backup. Based upon its performance in Task Force XXI Advanced Warfighting Experiment of March 1997, GLPS was approved to be part of the Army's Warfighting Rapid Acquisition Program (WRAP), which would expedite fielding.[239]

In 1998 the Army tested GLPS prototypes and revised the number to be fielded. Initial operational testing and evaluation in July-October 1998 and subsequent climatic testing in Alaska and Australia demonstrated the GLPS's overall ability to meet the requirements, even though accuracy and correctable maintenance problems existed, and permitted moving into follow-on testing and evaluation in 1999. In the meantime, the growing need to reduce the amount of work by the survey team in light units, the Army decided to expand the number of GLPSs from one per battery to two per battery.[240]

ADVANCED FIELD ARTILLERY TACTICAL DATA SYSTEM

Almost ten years after the Field Artillery had initially recognized the need for a computer for command, control, and communications to improve its responsiveness on a mobile battlefield, it gained its first experience with the application of automated data processing in 1959 with the development of the Field Artillery Digital Automated Computer (FADAC). The computer calculated fire direction data faster and more accurately than humans could and promised highly accurate and rapid fire. However, the breakdown of equipment, the requirement to back up the computer with manual procedures, and the lack of education about the computer's capabilities caused many Field Artillerymen of the late 1950s and early 1960s to accept computerized gunnery reluctantly.[241]

The drive for better responsiveness as the battlefield was becoming more mobile and desire for first-round accuracy encouraged the Army to develop a second-generation computer for field artillery command, control, and communications. Between 1961 and 1965, the Army conducted extensive studies to determine where improvements to automation should be made. The results of the studies led to the requirement for the Tactical Fire Direction System (TACFIRE), which was fielded in the mid-1970s and provided technical and tactical fire

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[239]1997 USAFACFS ACH, p. 101.

[240]Interview, Dastrup with Dies and Todd, 2 Mar 99.

[241]1995 USAFACFS ACH, p. 148.

direction data.[242]

[242]Ibid., pp. 148-49; Memorandum for Boyd Dastrup, subj: Untitled, 26 Feb 99, Doc III-157.

Because TACFIRE was large, heavy, and based on 1950s and 1960s technology, the Army took steps to replace it. In response to a memorandum of 13 November 1978 from the Office of the Undersecretary of Defense for Research and Engineering that authorized a new computer for fire support command, control, and communications, the Army initiated work on a successor system that would optimize operational efficiency, simplify training, ease maintenance requirements, reduce life cycle costs, and improve survivability. Later in 1981, the Army and the Department of Defense (DOD) approved developing the Advanced Field Artillery Tactical Data System (AFATDS) as part of the Army Tactical Command and Control System (ATCCS), which would be a family of computers, peripherals, operating systems, utilities, and software to support each individual battlefield operating system.[243]

After a decade of work on the hardware and the software that was fraught with many software developmental delays, the Army started testing AFATDS to determine its readiness for fielding. According to the Field Artillery School in 1990, AFATDS represented a complete departure from TACFIRE. Whereas AFATDS offered distributive (decentralized) processing using office computers, networking of computers, and employing task menus, TACFIRE depended upon centralized command and control and was a format driven system. TACFIRE taxed training because the operator had to memorize many formats and legal entries and had to use them frequently to remember them. As such, AFATDS would be more user friendly and a significant improvement over TACFIRE.[244]

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[243]1996 USAFACFS ACH, pp. 152-53.

[244]Ibid., p. 153.

Work on the software for AFATDS pressed forward in 1990-91. On 27 April 1990 the Army signed the full-scale development contract with Magnavox for version one (later renamed AFATDS 96) software. Scheduled for fielding in 1994, version one would update the software developed for the concept evaluation program that was conducted late in 1989, provide initial functionality at all echelons of fire support from the corps to platoon level, and would integrate field artillery, mortar, naval gunfire, and close air support into planning and execution functions. In fact, the Preliminary Design Review held in November 1991 verified moving version one software (AFATDS 96) into the critical design phase of development with Force Development Testing and Experimentation (FDTE) scheduled for September 1993. However, software problems forced rescheduling the FDTE for October 1993. Work on version two (AFATDS 97) software, which would have more capabilities than version one, in the meantime, began during the latter months of 1992. Subsequently, a private contractor or the government would produce version three (AFATDS 00) software, which would have even more capabilities than version one or two and would meet the objective system requirements.[245]

Technical problems with version one software arose during technical testing in 1993 and caused delaying the FDTE again. In fact, in August 1993 the Army slipped the FDTE from October 1993 to January 1994. Pushing back the FDTE also forced moving the Initial Operational Test and Evaluation (IOTE) from May-June 1994 to July-September 1994. Further version one (AFATDS 96) software problems caused the IOTE to be moved into mid-1995.[246]

After the FDTE of May 1995 had determined that AFATDS version one had been improved since the initial testing and was ready for operational testing, the Operational Test and Evaluation Command held an Initial Operational Test and Evaluation (IOTE) in July-September 1995 at Fort Hood, Texas. The test unit, the 1st Cavalry Division, conducted a pilot test, a record test, and an interoperability test. Although the tests revealed some deficiencies, no single or aggregation of deficiencies warranted rating the system as being ineffective. During the tests, AFATDS version one (AFATDS 96) demonstrated its ability to receive and process information from a variety of sources to support tactical field artillery fire plans and showed that it enhanced the maneuver commander's control of fire support. In view of this and the overall success of the test, the Office of the Assistant Secretary of the Army for Research, Development, and

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[245] Ibid., pp. 153-54.

[246] Ibid., pp. 154-55.

Acquisition authorized the Program Executive Officer for Command, Control, and Communications Systems in December 1995 to proceed with full-rate production with AFATDS and to field version one (AFATDS 96) software. In 1996-97 the Army sent the system through many technical and operational tests to ensure that deficiencies identified in the 1995 IOTE had been resolved and fielded AFATDS 96 to a division artillery, three corps artilleries, two army fire support elements, three battlefield coordination detachments, an enhanced deep operations coordination cell, and command post Tango in Korea units.[247]

[247] Ibid., p. 155; "AFATDS Update," Field Artillery, Mar-Apr 98, p. 34, Doc III-158; FY 95 Report (Summary), Director of Operational Test and Evaluation, subj: AFATDS, Doc III-159; FY 97 Report (Summary), Director of Operational Test and Evaluation, subj: AFATDS, Doc III-160; Report, subj: Assessment Report for the Division XXI AWE, Jan 98, Section 3, Doc III-67.

In the midst of developing, testing, and fielding of the AFATDS 96 software, the Field Artillery School participated in Task Force XXI Advanced Warfighting Experiment (AWE) in 1997 that focused on the digitized brigade of 2003. The AWE consisted of live and constructive simulations and culminated with a brigade task force rotation at the National Training Center, Fort Irwin, California, in March 1997 and employed AFATDS hardware and an experimental version of AFATDS 97 software as one of its digitized systems. As might be expected, the AWE produced key lessons for AFATDS 97. One officer in the TRADOC System Manager (TSM) AFATDS in the Field Artillery School noted that most difficult challenge for combat developers was introducing software in the age of computers and digitization of military forces. Under the AFATDS development and fielding concept the unit received the complete hardware package just prior to new equipment training. However, the Army did not deliver the objective AFATDS software. It delivered AFATDS software incrementally in a series of versions, as previously mentioned, with each building on the previous one.[248]

As TSM AFATDS pointed out, this software fielding format produced training challenges. Units had to train and qualify operators at fielding, had to furnish sustainment training on existing software, and had to provide training on each software version as it was delivered. For example, the Task Force XXI version of AFATDS 97 was immature and untested. In an effort to optimize the software, combat developers and software engineers continued to issue improvements to AFATDS 97 right up until the start of the AWE. The battalion literally loaded new software as it prepared for the AWE. As a result, operators and leaders neither fully understood nor were trained on the new software.[249]

In view of this experience with Task Force XXI and the time lost because of unexpected software problems, the Army and TSM AFATDS concluded that they had to modify the fielding format. They had to permit time for training to be completed. For example, in the sixty days preceding the Division AWE of late 1997 that followed the Task Force XXI AWE, the unit received no new software AFATDS 97 changes so that training could take place. This gave leaders and operators confidence with the software and their ability to fight digitally. Also, the Division AWE indicated that the Army and TSM AFATDS had to expedite fixes identified by commanders into the software and get them to field sooner so that training could be completed.[250]

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[248]1997 USAFACFS ACH, pp. 104-05.

[249]Ibid., p. 105; "AFATDS Update," Field Artillery, Mar-Apr 98, p. 34; Report, subj: Assessment Report for the Division XXI AWE, Jan 98, Section 3.

[250]1997 USAFACFS ACH, p. 105; Report, subj: Assessment Report for the Division XXI Awe, Jan 98, Section 3.

Meanwhile, as the AWEs were taking place, the Army planned to field three different variants of AFATDS version two between 1997 and 1999 as AFATDS 97, AFATDS 98, and AFATDS 99 and AFATDS version three software in 2000 as AFATDS 00. As explained by U.S. Army Training and Doctrine Command (TRADOC) System Manager (TSM) for Fire Support Command, Control, and Communications (FSC3) in the fall of 1996, the releases would enhance corps and echelons-above-corps deep operations functions, joint capabilities, and Multiple-Launch Rocket System (MLRS) and Paladin howitzer interfaces and lead to full technical fire direction capabilities. Specifically, AFATDS 97 would furnish corps and echelons-above-corps functionality, modify MLRS/Army Tactical Missile System (ATACMS) command and control processes, and enable the Field Artillery to plan and execute deep battle operations faster and safer than ever before.[251]

AFATDS 98, AFATDS 99, and AFATDS 00 would provide additional capabilities. To be released in 1998, AFATDS 98 would concentrate on U.S. Marine Corps/joint functionality, meet Department of Defense computing standards, and facilitate greater interoperability among the services. AFATDS 99, scheduled for release in 1999, would begin the move toward technical fire direction on a single platform by building direct interfaces with MLRS and Paladin, while AFATDS 00 would be version three software, would be the objective system, and would be released in 2002. With AFATDS 00 software, AFATDS would automate all 321 specified fire support tasks developed at the Field Artillery School. Moreover, AFATDS would operate in the fire support element and fire support coordination centers of the supported maneuver force and field artillery command posts, fire direction centers, and selected field artillery elements throughout the command structure to furnish integrated, responsive, and reliable fire support. Reflecting upon the state of AFATDS development in 1998, a conference held at the U.S. Army Field Artillery School in June 1998 concluded that AFATDS was on the right track and that it would greatly facilitate command, control, and communications for field artillery units.[252]

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[251]1996 USAFACFS ACH, pp. 155-56.

[252]1997 USAFACFS ACH, p. 104; Msg, subj: Annual History Report, 2 Feb 99, Doc III-161; Fact Sheet, subj: AFATDS, 29 Oct 98, Doc III-162.

Technical problems and Task Force XXI recommendations, in the meantime, delayed fielding AFATDS 97 from 1997 into 1998. Following a limited users test in October 1997 to ensure that deficiencies cataloged in previous tests had been resolved and following the integration of functional improvements identified during Task Force XXI, the Army released AFATDS 97 in April 1998 and fielded it to the XVIII Airborne Corps artillery, the 82nd Airborne Division artillery, the 101st Airborne Division artillery, and the 2nd Battlefield Coordination Detachment. For units already equipped with AFATDS 96, new equipment training teams conducted five weeks of training on AFATDS 97 that focused upon the differences between the two version.[253]

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[253]"AFATDS Update," Mar-Apr 98, p. 34; Msg, subj: Annual History Report, 2 Feb 99; LTC Douglas G. Beley, "AFATDS and the Task Force AWE," Field Artillery, Jan-Feb 98, p. 4, Doc III-163; "AFATDS Update,: Field Artillery, May-Jun 98, p. 17, Doc III-164; "AFATDS Update," Field Artillery, Sep-Oct 98, p. 27, Doc III-165; FY97 Report (Summary), Director of Operational Test and Evaluation, subj: AFATDS; FY98 Report (Summary), Director of Operational Test and Evaluation, subj: AFATDS.

Based upon existing and future capabilities of AFATDS, the Deputy TRADOC System Manager for AFATDS in the Field Artillery School early in 1998 postulated a paradigm shift in fire control. With TACFIRE or the Initial Fire Support Automated System (IFSAS) the fire direction center was the nucleus for planning and delivering fires. In AFATDS units the fire support officer's role would expand to "focus the artillery fight during both planning and execution."[254] The brigade fire support officer would orchestrate the artillery battle using AFATDS fire support tools. "Many activities and, more importantly, fire support decisions traditionally expected of the fire direction officer [would] become the FSO's [fire support officer's]. Decisions to modify attack guidance and priority of fires now can be made and implemented at the brigade FSE [fire support element]," the deputy wrote in the January-February 1998 edition of Field Artillery.[255] Ultimately, the key to massing battalion fires and focusing fires to support the brigade commander would be a well-trained brigade and battalion fire support officer. Only time would tell if the forecast was accurate.[256]

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[254]Beley, "AFATDS and the Task Force AWE," p. 5.

[255]Ibid.

[256]Ibid.

In efforts to ensure that its Total Army capabilities and power projection responsibilities were met, in the meantime, the Army revised the fielding schedule for AFATDS in 1998. The new fielding methodology established by the Army determined that "first-to-fight" units with their "go-to-war" reserve supporting units would be fielded first and less critical active component units and their supporting reserve units would be fielded next. Under the old practice the active component units were scheduled to receive AFATDS through Fiscal Year (FY) 2004, and then all National Guard units would be fielded from FY 2004 through FY 2008. This practice created a disconnect because many National Guard roundout units would not be AFATDS capable, while their active component units would be.[257]

[257]Msg with Atchs, subj: Revised AFATDS Fielding Plan, 12 Feb 99, Doc III-167.

LIST OF ACRONYMS

ABCS, Army Battlefield Control System
AC, Active Component/Assistant Commandant
ACH, Annual Command History
ACR, Armored Cavalry Regiment
ACTD, Advanced Concept Technology Demonstration
ADA, Air Defense Artillery
ADLP, Army Distance Learning Plan
AFAS, Advanced Field Artillery System
AFATDS, Advanced Field Artillery Tactical Data System
AG/MPO, Adjutant General/Military Personnel Office
AGR, Active Guard Reserve
AHR, Annual Historical Review
AIT, Advanced Individual Training
ALO, Authorized Level of Organization
ARAC, Army Radar Approach Control
ARARNG, Arkansas National Guard
Army TACMS, Army Tactical Missile System
ARNG, Army National Guard
ARTEP, Army Training and Evaluation Program
ASARC, Army System Acquisition Review Council
ASARDA, Assistant Secretary of Army for Research, Development and Acquisition
ATACMS, Army Tactical Missile System
ATACS, Advanced Target Acquisition Counterfire System
ATC, Artillery Training Center
ATCAS, Advanced Towed Cannon System
ATCCS, Army Tactical Command and Control System
ATD, Advanced Technology Demonstration
ATDL, Army Training Digital Library
ATLAS, Advanced Technology Light Artillery System
ATTD, Advanced Technological Transition Demonstration
AWE, Advanced Warfighting Experiment
BASOPS, Base Operations
BAT, Brilliant Antiarmor Submunition
BAT P3I, BAT Preplanned Product Improvement
BCD, Battlefield Coordination Detachment
BFIST, Bradley Fire Support Vehicle
BNCOC, Basic Noncommissioned Officer Course
BRAC, Base Realignment and Closure
CAB, Command and Attack Battalion
CAC, Combined Arms Center
CAN, Campus Area Network
CAS3, Combined Arms Services Staff School
CATS, Combined Arms Training Strategy
CATT, Combined Arms Tactical Trainer

CBI, Computer Based Instruction
CCC, Captain's Career Course
C3, Command, Control, and Communications
C4I, Command, Control, Communications, Computers, and Intelligence
C2I, Command, Control, and Information
CCTT, Close Combat Tactical Trainers
CG, Commanding General
CGSC, Command and General Staff College
CINCOS, Change in Noncommissioned Officer Structure
CIS, Central Instrumentation Systems
CLASS, Closed Loop Artillery Simulation System
CMF, Career Management Field
COB, Command Operating Budget
COBRA, Counterbattery Radar
COLT, Combat Observation Lasing Team
CONUS, Continental United States
CPT PME, Captain Professional Military Education
CPX, Command Post Exercise
CSSG, Close Support Study Group
CTC, Combat Training Center
CTCS, Collective Training Control Subsystem
CW, Chief Warrant Officer
DA, Department of the Army
DAB, Defense Acquisition Board
DAC, Deputy Assistant Commandant/Department of the Army Civilian
DACOWITS, Defense Advisory Committee on Women in the Service
DAIG, Department of the Army Inspector General
DARE, Drug Abuse Resistance Education
DARPA, Defense Advanced Research Projects Agency
DAWE, Division Advanced Warfighting Experiment
DCA, Directorate of Community Activities
DCD, Directorate of Combat Developments
DCP, Directorate of Civilian Personnel
DCSPER, Deputy Chief of Staff for Personnel
DCSOPS, Deputy Chief of Staff for Operations
DEQ, Directorate of Environment Quality
DCG, Deputy Commanding General
DIS, Distributed Interactive Simulation
DOC, Directorate of Contracting
DOD, Department of Defense
DOIM, Directorate of Information Management
DOL, Directorate of Logistics
DOPMA, Defense Officer Personnel Management Act
DPICM, Dual-Improved Conventional Munition
DPTM, Directorate of Plans, Training, and Mobilization
DPW, Directorate of Public Works
DRM, Directorate of Resource Management
DSARC, Defense Systems Acquisition Review Council
DSTATS, Digital Systems Test and Training Simulator
DTAC, Digital Training Access Center
DTE, Directorate of Training and Evaluation
DTLOMS, Doctrine, Training, Leadership, Organization Design, Materiel Requirements, and Soldier Support
DTTP, Doctrine, Tactics, Techniques, and Procedures
ECC, Effects Coordination Cell

EMD, Engineering and Manufacturing Development
EPLRS, Enhanced Position Location Reporting System
ER, Extended Range
FA, Field Artillery
FAA, Federal Aviation Administration
FADAC, Field Artillery Digital Automated Computer
FAOAC, Field Artillery Officer Advanced Course
FAOBC, Field Artillery Officer Basic Course
FAPO, Field Artillery Proponency Office
FAS, Field Artillery School
FAST, Future Army Schools Training
FATC, Field Artillery Training Center
FDC, Fire Direction Center
FDSWS, Future Direction Support Weapon System
FDTE, Force Development Test and Evaluation
FF, Firefinder
FIST, Fire Support Team
FISTV, Fire Support Vehicle
FLIR, Forward Looking Infrared
FLOT, Forward Line of Troops
FM, Field Manual
FORSCOM, U.S. Army Forces Command
FOTE, Follow-on Test and Evaluation
FSATS, Fire Support Automated Test System
FSCAOD, Fire Support and Combined Arms Operations Department
FSCATT, Fire Support Combined Arms Tactical Trainer
FSC3, Fire Support Command, Control, and Communications
FSCL, Fire Support Coordination Line
FSO, Fire Support Officer
FSTS, Fire Support Training Strategy
FTX, Field Training Exercise
FY, Fiscal Year
GAO, General Accounting Office
GD, Gunnery Department
GLPS, Gun Laying Positioning System
GOSC, General Officer Steering Committee
GPS, Global Positioning System
GSM, Ground Station Module
GUARDFIST II, Guard Unit Armory Device-Full-Crew Interactive Simulation Trainer II
G/VLLD, Ground/Vehicular Laser Locator Designator
HCT, Howitzer Crew Trainer
HIMARS, High Mobility Artillery Rocket System
HMMWV, High Mobility Multipurpose Wheeled Vehicle
HQ, Headquarters
HQDA, Headquarters, Department of the Army
HSOT, Howitzer Strap on Trainer
IDT, Inactive Duty
IET, Initial Entry Training
IFCS, Improved Fire Control System
IFSAS, Interim Fire Support Automated System/Initial Fire Support Automated System
ILMS, Improved Launcher Mechanical System
IOTE, Initial Operational Test and Evaluation
IPDS, Improved Positioning Determining System
JCF AWE, Joint Contingency Force Advanced Warfighting Experiment

JCS, Joint Chiefs of Staff
JORD, Joint Operational Requirements Document
JPSD, Joint Precision Strike Demonstration
JRTC, Joint Readiness Training Center
JSTARS/Joint STARS, Joint Surveillance Target Attack Radar System
LAN, Local Area Network
LETRA, Lake Elmer Thomas Recreation Area
LLDR, Lightweight Laser Designator Rangefinder
MACS, Modular Artillery Charge System
MAPS, Modular Azimuth Positioning System
MICOM, U.S. Army Missile Command
MILES, Multiple Integrated Laser Engagement System
MLRS, Multiple-Launch Rocket System
MOA, Memorandum of Agreement
MOS, Military Occupational Specialty
MRL, Multiple Rocket Launcher
MRS, Mobility Requirements Study
MSE, Mobile Subscriber Equipment
MTP, Mission Training Plan
NBC, Nuclear, Biological, and Chemical
NCO, Noncommissioned Officer
NCOA, Noncommissioned Officer Academy
NCOES, Noncommissioned Officer Education System
NEPA, National Environmental Policy Act
NET, New Equipment Training
NETD, New Equipment Training Detachment
NTC, National Training Center
OAC, Officer Advanced Course
OBC, Officer Basic Course
OCONUS, outside Continental United States
ODAP, Officer Development Action Plan
ODP, Officer Distribution Plan
ODS, Operation Desert Shield/Operation Desert Storm
OMA, Operations and Maintenance, Army
OMB, Office of Management and Budget
OPMS, Officer Personnel Management System
ORD, Operational Requirements Document
ORI, Officer Restructure Initiative
OSD, Office of the Secretary of Defense
OSUT, One Station Unit Training
PCS, Permanent Change of Station
PEO, Program Executive Officer
PERSCOM, Personnel Command
PI, Product Improvement
POI, Program of Instruction
PM, Program Manager
PME, Professional Military Education
POI, Program of Instruction
POM, Program Objective Memorandum
P3I, Preplanned Product Improvement
QDR, Quadrennial Defense Review
RAM, Reliability, Availability, and Maintainability
RAMS, Rocket and Missile Systems
RC, Reserve Component

RFPI, Rapid Force Projection Initiative
RFPI ACTD, Rapid Force Projection Initiative Advanced Concept Technology Demonstration
RIF, Reduction-in-Force
ROTC, Reserve Officer Training Corps
SADARM, Sense-and-Destroy Armor Munition
SATS, Standard Army Training System
SAWE, Simulated Area Weapons Effect
SDR, Surrogate Data Radio
SINCGARS, Single-channel Ground and Airborne Radio System
SJA, Staff Judge Advocate
STRICOM, U.S. Army Simulation Training and Instruction Command
TACFIRE, Tactical Fire Direction System
TADSS, Training Aids, Devices, Simulators and Simulations
TASS, Total Army School System
TATS, Total Army Training Strategy
TBMCS, Theater Battle Management Core Systems
TDA, Tables of Distribution and Allowances
TDY, Temporary Duty
TELS, Transporters, Erectors, and Launchers
TF, Task Force
TMD, Theater Missile Defense
TNET, Telecommunications Satellite Network
TOE, Table of Equipment
TRADOC, U.S. Army Training and Doctrine Command
TSC, Training Service Center
TSM, TRADOC System Manager
TSP, Training Support Package
TSSAM, Tri-Service Stand-off Attack Missile
TTP, Tactics, Techniques, and Procedures
USAASA, U.S. Army Aeronautical Services Agency
USACGSC, U.S. Army Command and General Staff College
USAF, U.S. Air Force
USAFAC, U.S. Army Field Artillery Center
USAFACFS, U.S. Army Field Artillery Center and Fort Sill
USAFACS, U.S. Army Field Artillery Center and School
USAFAS, U.S. Army Field Artillery School
USAFATC, U.S. Army Field Artillery Training Center
USAG, U.S. Army Garrison
USAR, U.S. Army Reserve
USEUCOM, United States European Command
VERA, Voluntary Early Retirement Authority
VSEL, Vickers Shipbuilding and Engineering Limited
VSIP, Voluntary Separation Incentive Program
VTC, Video Training Conference
VTT, Video Teletraining
WIDD, Warfighting Integration and Development Directorate
WOAC, Warrant Officer Advanced Course
WOBC, Warrant Officer Basic Course
WRAP, Warfighting Rapid Acquisition Program
XO, Executive Officer
ZBB, Zero Base Budget

APPENDIX ONE

STUDENT PRODUCTION FOR FISCAL YEAR 1998

Course	Initial Input	Graduates
FA Officer Advanced Course	478	421
FA Officer Basic Course	1,186	1,021
Basic Noncommissioned Officer Courses	424	417
Advanced Noncommissioned Officer Courses	230	226

Platoon Leader Development Courses	351	338
Total	2,669	2,423
U.S. Army Field Artillery Training Center (Basic Combat Training, One Station Unit Training, Advanced Individual Training, and U.S. Marines)	17,948	17,018
Grand Total for FY 1998	20,617	19,441

Source: Msg, subj: FATC Input to 1998 Annual Command History, 26 Mar 99, Doc I-72; Department of the Army, AIMS, Information Management Office, 26 Mar 99, Doc I-73; Msg, subj: NCOA Input to 1998 Annual Command History, 29 Mar 99, Doc I-74.

APPENDIX TWO
KEY TRAINING COMMAND PERSONNEL

Commandant and Chief of Field Artillery:
MG Leo J. Baxter, 7 June 97-present
Assistant Commandant and Deputy Commanding General-Training:
BG Toney Stricklin, 13 Jun 97-17 Apr 98
BG Lawrence R. Adair, 17 Apr 98-present
Chief of Staff, Training Command/Commander of the 30th FA Regiment:
Col David C. White, 19 Jun 96-18 May 98
Col Theodore J. Janosko, 18 May 98-present
Commander, U.S. Army Field Artillery Training Center:
Col Michael W. McKeeman, 6 Jun 96-8 Jun 98
Col Gerard M. Walsh, 8 Jun 98-present
Noncommissioned Officers Academy:

CSM Gene Odom, Oct 97-present
Deputy Assistant Commandant-Futures:
Col Sammy Coffman, 7 Jul 98-present
Director, Warfighting Integration and Development Directorat
Col N.E. Nelson, Sep 97-1 Jul 98
Col David D. Cutler, 7 Jul 98-present
Director, Directorate of Combat Developments:
Col Kermit Edney, Jr., Sep 95-Jun 98
LTC Russell J. Hall, Jul 98-present
Director, Gunnery Department:
Col H.K. Anderson, Jul 96-Oct 98
Col T.G. Waller, Jr., Nov 98-present
Director, Fire Support and Combined Arms Operations Department
Col L.G. Swartz, 18 Aug 97-15 Aug 98
Col John A. Yingling, 15 Aug 98-present
Director, Depth and Simultaneous Attack Battle Laboratory:
Col Sammy Coffman, Jul 96-Jul 98
Col Peter S. Corpac, Jul 98-present

APPENDIX THREE

KEY USAFACFS PERSONNEL

Commanding General/Commandant of U.S. Army Field Artillery School/Chief of Field Artillery:
MG Leo J. Baxter, 7 Jun 97-present
Chief of Staff:
Col Guy M. Bourn, Oct 97-1 May 98
Col David C. White, 1 May 98-present
Deputy Commanding General-National Guard:
Col D. McCall, 1 Oct 98-present
Base Operations Manager/Deputy Garrison Commander:
Col D.J. Bonney, 17 Apr 97-present
Secretary to the General Staff:
Maj R.P. Smith, 2 Jun 97-present
Director, Directorate of Community Activities:
Daniel G. Linehan, Jr., 1 Oct 93-present
Director, Directorate of Civilian Personnel:
John D. Kerr, 29 Sep 96-present

Director, Directorate of Information Management:
J. Parker, 1 Oct 96-present
Director, Directorate of Logistics:
T.S. Haymend, 12 May 96-present
Director, Directorate of Contracting:
Bernie Valdez, Jan 97-present
Director, Directorate of Resource Management:
Col Robert L. Hansen, Jr., 8 Jul 96-present
Director, Directorate of Public Works:
Dennis J. Hergenrether (acting) 7 Dec 97-1 Jun 98
Col Gary W. Wright, 1 Jun 98-present
Director, Directorate of Environmental Quality:
R.O. Barnett, 1992-3 Apr 98
T.U. Eldridge, 3 Apr 98-present
Director, Directorate of Plans, Training, and Mobilization:
Col Herbert G. Brown, Oct 97-present

APPENDIX FOUR

LIST OF PAST FIELD ARTILLERY SCHOOL COMMANDANTS

CPT Dan T. Moore, 19 Jul 1911-15 Sep 1914
LTC Edward F. McGlachlin, Jr., 15 Sep 1914-26 Jun 1916
School was closed 26 June 1916-27 July 1917
COL William J. Snow, 27 Jul 1917-26 Sep 1917
BG Adrian S. Fleming, 26 Sep 1917-11 May 1918
BG Laurin L. Lawson, 11 May 1918-18 Dec 1918
BG Dennis H. Currie, 24 Dec 1918-10 Jun 1919
BG Edward T. Donnely, 30 Jun 1919-9 Jul 1919
MG Ernest Hinds, 25 Oct 1919-1 Jul 1923
MG George LeR. Irwin, 1 Jul 1923-1 Apr 1928
BG Dwight E. Aultman, 6 Apr 1928-12 Dec 1929
BG William Cruikshank, 8 Feb 1930-31 Jul 1934
MG Henry W. Butner, 17 Sep 1934-10 Mar 1936
BG Augustine McIntyre, 29 Jun 1936-31 Jul 1940
BG Donald C. Cubbison, 1 Aug 1940-22 Dec 1940
BG George R. Allin, 20 Jan 1941-30 Jun 1942
BG Jesmond D. Balmer, 1 Jul 1942-11 Jan 1944

MG Orlando Ward, 12 Jan 1944-30 Oct 1944
MG Ralph McT Pennell, 31 Oct 1944-30 Aug 1945
MG Louis E. Hibbs, 30 Aug 1945-4 Jun 1946
MG Clift Andrus, 20 Jun 1946-15 Apr 1949
MG Joseph M. Swing, 9 Apr 1949-31 Mar 1950
MG Arthur M. Harper, 2 Apr 1950-16 Nov 1953
MG Charles E. Hart, 4 Jan 1954-28 May 1954
MG Edward T. Williams, 8 Jul 1954-23 Feb 1956
MG Thomas E. de Shazo, 12 Mar 1956-31 Jan 1959
MG Verdi B. Barnes, 15 Feb 1959-25 Mar 1961
MG Lewis S. Griffing, 6 Apr 1961-31 Mar 1964
MG Harry H. Critz, 1 Apr 1964-15 May 1967
MG Charles P. Brown, 5 Jul 1967-20 Feb 1970
MG Roderick Wetherill, 24 Feb 1970-31 May 1973
MG David E. Ott, 1 Jun 1973-24 Sep 1976
MG Donald R. Keith, 9 Oct 1976-21 Oct 1977
MG Jack N. Merritt, 22 Oct 1977-26 Jun 1980
MG Edward A. Dinges, 27 Jun 1980-27 Sep 1982
MG John S. Crosby, 28 Sep 1982-3 Jun 1985
MG Eugene S. Korpal, 4 Jun 1985-17 Aug 1987
MG Raphael J. Hallada, 20 Aug 1987-19 Jul 1991
MG Fred F. Marty, 19 Jul 1991-15 Jun 1993
MG John A. Dubia, 15 Jun 1993-7 Jun 1995
MG Randall L. Rigby 7 Jun 1995-7 Jun 1997
MG Leo J. Baxter, 7 Jun 1997-present

This list represents the most accurate information currently available at Fort Sill. Since World War I, the school commandant has also served as post commander of Fort Sill.

APPENDIX FIVE
CHIEFS OF FIELD ARTILLERY

*MG William J. Snow, 15 Feb 1918-19 Dec 1927
*MG Fred T. Austin, 20 Dec 1927-15 Feb 1930
*MG Harry G. Bishop, 10 Mar 1930-9 Mar 1934
*MG Upton Birnie, Jr., 10 Mar 1934-24 Mar 1938
*MG Robert M. Danford, 26 Mar 1938-9 Mar 1942
BG George R. Allin, 20 Jan 1941-31 Jun 1942
BG Jesmond D. Balmer, 1 Jul 1942-11 Jan 1944
MG Orlando Ward, 12 Jan 1944-30 Oct 1944
MG Ralph McT Pennell, 31 Oct 1944-30 Aug 1945
MG Louis E. Hibbs, 30 Aug 1945-4 Jun 1946
MG Clift Andrus, 20 Jun 1946-15 Apr 1949
MG Joseph M. Swing, 9 Apr 1949-31 Mar 1950
MG Arthur M. Harper, 2 Apr 1950-16 Nov 1953
MG Charles E. Hart, 4 Jan 1954-28 May 1954
MG Edward T. Williams, 8 Jul 1954-23 Feb 1956
MG Thomas E. de Shazo, 12 Mar 1956-31 Jan 1959
MG Verdi B. Barnes, 15 Feb 1959-25 Mar 1961
MG Lewis S. Griffing, 6 Apr 1961-31 Mar 1964
MG Harry H. Critz, 1 Apr 1964-15 May 1967

MG Charles P. Brown, 5 Jul 1967-20 Feb 1970
MG Roderick Wetherill, 24 Feb 1970-3l May 1973
MG David E. Ott, l Jun 1973-24 Sep 1976
MG Donald R. Keith, 9 Oct 1976-2l Oct 1977
MG Jack N. Merritt, 22 Oct 1977-26 Jun 1980
MG Edward A. Dinges, 27 Jun 1980-27 Sep 1982
*MG John S. Crosby, 28 Sep 1982-3 Jun 1985
*MG Eugene S. Korpal, 4 Jun 1985-17 Aug 1987
*MG Raphael J. Hallada, 20 Aug 1987-19 Jul 1991
*MG Fred F. Marty, 19 Jul 1991-15 Jun 1993
*MG John A. Dubia, 15 Jun 1993-7 Jun 1995
*MG Randall L. Rigby 7 Jun 1995-7 Jun 1997
*MG Leo J. Baxter, 7 Jun 1997-present

*Individuals with an asterisk by their name were officially recognized by the Department of War or Department of the Army as the Chief of Field Artillery. The War Department created the Office of the Chief of Field Artillery on 15 February 1918 to supervise the Field Artillery. On 9 March 1942 the War Department abolished the Office of the Chief of Field Artillery as part of a general wartime reorganization and placed the Field Artillery under the Army Ground Forces. In 1983 the Department of the Army reestablished the Chief of Field Artillery to oversee the development of Field Artillery tactics, doctrine, organization, equipment, and training. Although the War Department and later the Department of the Army did not recognize an official Chief of Field Artillery from 1942 through 1983, the Commandants of the U.S. Army Field Artillery School and its predecessors during those years considered themselves to be the Chief of Field Artillery.

APPENDIX SIX

DOCUMENTS

CHAPTER ONE

I-1. "Farewells, Hellos Theme of Ceremony," Fort Sill Cannoneer, 23 Apr 98, p. 1a.
I-2. Official Biography.
I-3. "Chief of Staff Leaves 'Home,'" Fort Sill Cannoneer, 30 Apr 98, p. 1a.
I-4. Official Biography.
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I-6. "New Fort Sill Deputy Commanding General," Field Artillery, Nov-Dec 98, p. 13.
I-7. "Fort Sill to Face Fiscal Year 1999 Budget Cuts," Fort Sill Cannoneer, 18 Dec 97, p. 1a, 2a.
I-8. Memorandum for See Distribution, subj: FY 98 Appropriation TRADOC Budget Guidance, 22 Dec 97.
I-9. Memorandum for See Distribution, subj: FY98 Appropriation TRADOC Budget Guidance, 12 Jan 98.
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I-18. Memorandum for See Distribution, subj: FY 99 Budget Vision Decrements, 9 Apr 98.
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I-30. Briefing, subj: FY99 Command Operating Budget Review, USAFAS/Training Command, 9 Jun 98.
I-31. Briefing, subj: FY99 Vision Budget CG Approved Plan, 11 May 98.
I-32. Memorandum for See Distribution, subj: FY99 Command Operating Budget, 14 May 98.
I-33. "SIll Employees Prepare for Possible Budget Reduction," Fort SIll Cannoneer, 22 Jan 98, p. 1a.
I-34. "Expected Budget Cuts Suspend Some Hiring Actions," Fort SIll Cannoneer, 8 Jan 98, pp. 1a, 3a.
I-35. "VSIP Application Window Open," Fort SIll Cannoneer, 14 May 98, p. 3a.
I-36. "Civilian Military Efforts Result in Smaller RIF," Fort SIll Cannoneer, 1 Oct 98, p. 1a.
I-36A. "RIF Team Carves Numbers from 192 to 15," Fort SIll Cannoneer, 19 Nov 98, pp. 1a, 3a.
I-37. "Civilian Reduction Plan Approved," Fort SIll Cannoneer, 25 Jun 98, p. 2a.
I-38. "VERA/VSIP Application Window Opens," Fort SIll Cannoneer, 13 Aug 98, pp. 1a, 3a.
I-39. Briefing, subj: FY99 Appropriation TRADOC Budget Guidance, Jan 99.
I-40. Memorandum for See Distribution, subj: FY99 Appropriation TRADOC Budget Guidance, 7 Jan 99.
I-41. Msg, subj: FY99 Authorization and Appropriation, 19 Oct 98.
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I-45. "DOIM, TSC to Undergo Cost Competition Study," Fort SIll Cannoneer, 3 Dec 98, pp. 1a, 5b.
I-46. "AG Next Target for Cost-Competition Study," Fort SIll Cannoneer, 10 Dec 98, p. 6a.
I-47. "Base Ops Studied at TRADOC Posts," Fort SIll Cannoneer, 3 Apr 97, pp. 1a, 2a.
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I-49. Memorandum for Command Historian with Atch (Extract), subj: Annual Command History, 13 Jan 99.
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I-54. Msg, subj: ARAC, 30 Nov 98.
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I-60. Memorandum for Towana Spivey, Dir, Fort SIll Museum subj: SME Review of Project Millennium for 1998 Annual Command History, 26 Feb 99.
I-61. Msg, subj: The National Army Museum of the Southwest, 15 Mar 99.
I-62. "Baxter Hosts City Council Meeting," Fort SIll Cannoneer, 24 Sep 98, pp. 1a, 6a.
I-63. "Lawton City Council Approves Annexation," Fort SIll Cannoneer, 25 Jun 98, p. 1a.
I-64. Interview, Dastrup with COL D.J. Bonney, Garrison Commander, Fort SIll, 19 Jan 99.
I-65. "Leaders Answer Soldier Questions About Annexation," Fort SIll Cannoneer, 9 Jul 98, pp. 1a, 3a.
I-66. "LETRA Opening to Offer New Opportunities," Fort SIll Cannoneer, 23 Apr 98, pp. 1a, 4b.
I-67. "LETRA Opens for Public Fun Day," Fort SIll Cannoneer, 1 Oct 98, p. 12a.
I-68. "In-line Hockey Rink, Leagues to Open," Fort SIll Cannoneer, 11 Jun 98, pp. 8a.
I-69. "LETRA Open to All," Fort SIll Cannoneer, 21 Jan 99, pp. 1a, 5a.
I-70. "MPs Train for Enhanced 911 Response," Fort SIll Cannoneer, 14 Jan 99, pp. 1a, 2a.
I-71. "Enhanced 911 Goes Online Early March," Fort SIll Cannoneer, 25 Feb 99, pp. 1a, 3a.

CHAPTER TWO

II-1. Memorandum for Record, subj: How did we get here from Aberdeen? 29 Oct 98.
II-2. Msg, subj: Branch History Video Tasker, 7 Feb 98.
II-2A. "IET: Starting the Soldier Out Right," Field Artillery, Mar-Apr 99, pp. 3-5.
II-2B. MG Leo J. Baxter, "IET: Where Values and Excellence Begin," Field Artillery, Mar-Apr 99, pp. 1-2.
II-2C. LTC Michael A. Byrd, "Army Values and Basic Training," Field Artillery, Mar-Apr 99, pp. 40.

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II-4. Msg, subj: Army Values, 171134Z Feb 98.
II-5. Msg, subj: Branch History Video Tasker, 23 Feb 98.
II-6. Msg, subj: IET Extension-Branch History/Heritage Videotapes, 28 Jan 98.
II-7. "New Soldiers Take to Values Training,"Army Link News, 25 Sep 98.
II-8. Memorandum for Record, subj: Values Training Dog Tag Card and Army Values Card, 25 Jan 99.
II-9. Memorandum for Record, subj: Values Training and Museum Visits, 27 Jan 99.
II-10. Memorandum for Record, subj: Field Artillery: King of Battle, 27 Jan 99.
II-11. "Sill Considered for Expanded Mission," Fort Sill Cannoneer, 2 Jul 98, pp. 1a, 2a.
II-12. Msg with Atchs, subj: Gender-integrated Training, 29 Jan 99.
II-12A. US Army Public Affairs News Release, "Fort Sill Takes on Gender-Integrated Training Mission," 4 Feb 99.
II-13. 1994 TRADOC Annual Command History (Extract), pp. 46-48.
II-14. Interview, Dastrup with Sharon Dorrell, WIDD, 19 Jan 99.
II-15. TRADOC Regulation 351-18 (Extract), Appendix C.
II-16. Briefing, subj: TATS Courseware Implementation Schematic Profile Update, 1998.
II-17. "Teletraining--Knox and Sill Develop OPORD," Field Artillery, May-Jun 98, p. 45.
II-18. Memorandum for Chief, TNET Branch, subj: After Action Report 13F30 BNCOC (Class 1-98 and 201-98), 18 Mar 98.
II-19. Memorandum for See Distribution, subj: Coordinating Draft of Army Distance Learning Operations Directive, 23 May 96.
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II-21. Memorandum for Dir, WIDD, subj: Memorandum of Agreement for Classroom XXI and Distance Learning, 15 Oct 97.
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II-22A. Briefing (Extract), subj: Training the Field Artillery, 28 Feb 98.
II-23. Memorandum (Extract) for Dir, WIDD, subj: Memorandum of Agreement for Classroom XXI and Distance Learning, 15 Oct 97.
II-24. Briefing, subj: TATS Courseware Implementation Schematic Profile Update, 1998.
II-25. Interview, Dastrup with Bill Lodes, WIDD, 4 Feb 99.
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II-29. Memorandum for MAJ William C. Burrell, FSCAOD, USAFAS, subj: SME Field Artillery Warrant Officer Courses for 1998 Annual Command History, 5 Mar 99.
II-30. Briefing, subj: Target Acquisition in Transition, ca. 1991-92.
II-30A. Briefing, subj: Fire Support, ca. 1992.
II-31. Briefing, subj: Fire Support, ca. 1993.
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II-35. "The Radar Technician and His Role," Field Artillery, Jul-Aug 96, p. 2.
II-36. Msg, subj: WO Transition Course, 26 Feb 99.
II-37. "WO 131A Targeting Transitioning Course," Field Artillery, Jan-Feb 96, p. 7.
II-38. Interview, Dastrup with MAJ William C. Burrell, Chief, Target Acquisition Division, FSCAOD, 26 Jan 99.
II-39. USAFAS Schedule of Classes FY99 (Extract).
II-40. Msg, subj: FAOBC Input for Annual History-Reply, 19 Jan 99.
II-41. Memorandum for See Distribution, subj: Changes to Field Artillery Course Curricula, 22 May 95.
II-42. "USAFAS Curriculum Revisions," Field Artillery, Sep-Oct 95, p. 45.
II-43. Interview, Dastrup with Glen Hubbard, Dep Dir, GD, and Ed Rowzee, Dir Ops, GD, 10 Dec 98.
II-44. Briefing, subj: Field Artillery Officer Training and Education, Jan 99.
II-44A. LTC Britt E. Bray and MAJ William M. Raymond, Jr., "Redleg Mentor Program: Sharpening the Sword, Nurturing the Spirit," Field Artillery, Mar-Apr 99, pp. 10-11.
II-44B. "OBC: Training the New Lieutenant," Field Artillery, Mar-Apr 99, p. 35.
II-45. "Field Artillery Training Command," Field Artillery, Nov-Dec 98, p. 32.
II-46. Interview, Dastrup with MAJ John J. Sweeney, Chief, Officer Instruction Branch, GD, 13 Jan 99.

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II-48. Briefing, subj: FAOBC Common Core, Jan 99.
II-49. Fact Sheet, subj: Fire Support Officer Lane, 27 Jan 99.
II-50. Fact Sheet, subj: Dismounted Fire Support Officer Fire Control Exercise, Feb 98.
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II-53A. Memorandum for Record, subj: CPT PME, 12 Apr 99.
II-54. Memorandum for Mel Hunt, WIDD, USAFAS, subj: SME Review of Captain Professional Military Education Portion of 1998 Annual Command History, 17 Feb 99.
II-55. Briefing, subj: CPT PME FA Captains Career Course, Dec 98.
II-55A. Briefing, subj: FA Officer Training and Education, Jan 99.
II-56. Briefing, subj: CPT PME General Officer Steering Committee, 30 Jan 98.
II-57. Briefing, subj: FA Officer Training and Education, Jan 99.
II-58. Fact Sheet, subj: FAOAC Common Core, Jan 99.
II-59. Memorandum for Record, subj: Executive Summary for CPT PME Council of Colonels-17 Nov 97 at Fort Leavenworth, 12 Jan 98.
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II-61. Memorandum for Record, subj: Executive Summary for CPT PME General Officer Steering Committee VTC-30 Jan 98, 12 Jan 98.
II-62. Memorandum for CG, TRADOC, and DCG, TRADOC, subj: CSA Visit to CAC, 21 Sep 98.
II-63. Msg, subj: Field Artillery Precommand Course, 2 Mar 99.
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II-65. Briefing, subj: MLRS 3x6 New Equipment Training Concept, Nov 98.
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II-75. Interview, Dastrup with MAJ Jeffrey A. Taylor, Chief, Paladin Division, GD, 16 Feb 96.
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II-77. Interview, Dastrup with MAJ Lawrence T. Hall, Paladin Division, GD, 15 Jan 97.
II-78. Memorandum for Cdr, 2-82nd FA, subj: Paladin NET Final Report, 14 Aug 96.
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II-80. Memorandum for Operations, GD, subj: Bi-weekly SIGACTS, 2 Dec 97.
II-81. Briefing, subj: Paladin NET Overview, 1998.
II-82. Interview, Dastrup with LTC William P. Troy, Chief, Paladin Division, GD, 26 Jan 99.
II-83. Memorandum for Cdr, 1-37th FA, subj: Paladin NET Final Report, 3 Dec 97.
II-84. Memorandum for Cdr, 1-6 FA, and Cdr, 1-7 FA, subj: Paladin NET Final Report, 12 May 98.
II-85. Memorandum for Cdr, 2-3 FA, subj: Paladin NET Final Report, 3 Aug 98.
II-86. Memorandum for Cdr, 1-5 FA, subj: Paladin NET Final Report, 10 Oct 98.
II-87. Memorandum for Cdr, 4-1 FA, subj: Paladin NET Final Report, 20 Nov 98.
II-88. Memorandum for Cdr, 1-127 FA, KSARNG, subj: Paladin NET Final Report, 30 Jun 98.
II-89. Memorandum for Cdr, 1-214 FA, GAARNG, subj: Paladin NET Final Report, 1 Aug 98.
II-90. Memorandum for Dir, GD, et al, subj: Paladin New Equipment Training, 14 Dec 98.
II-91. Memorandum for Record, subj: Annual History Input, 23 Feb 99.
II-92. Msg with Encls, subj: Paladin Staff Study, 28 Jan 99.
II-93. Msg, subj: Paladin NET-Reply, 1 Feb 99.
II-94. Msg, subj: NGB Approval of Extending NET Resources, 1 Feb 99.
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II-99. "New Simulator Helps Train Field Artillery Soldiers," Fort Sill Cannoneer, 29 Oct 98, pp. 1a, 3a.
II-100. Fact Sheet, subj: FSCATT, Feb 98.
II-101. Fact Sheet, subj: FSCATT, 16 Oct 98.
II-102. Fact Sheet, subj: FSCATT, 10 Dec 98.
II-103. Interview, Dastrup with Don Kraft, WIDD, 2 Feb 99.
II-104. Fact Sheet, subj: FSCATT, Dec 98.
II-105. Msg, subj: FSCATT Fielding Plan, 1 Feb 99.
II-106. Memorandum for B. Bielinski, WIDD, USAFAS, subj: SME Review of Developing Field Artillery Manuals Portion of 1998 Annual Command History, 17 Feb 99.
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II-108. Memorandum for Record, subj: Doctrinal Manual Update, 20 Jan 99.
II-109. Memorandum for Commandant, USAFAS, subj: Development of Doctrinal Publications, 8 Dec 98.
II-110. Memorandum for Cmdt, USAFAS, subj: Renaming the Command and Attack Battalion, 20 Oct 98.

CHAPTER THREE

III-1. "DAC-Futures Formed at FA School," Field Artillery, Sep-Oct 98, p. 26.
III-2. Memorandum for Record, subj: Briefing Slides, 1998.
III-3. "New Job Integrates Future," Fort Sill Cannoneer, 8 Oct 98, pp. 1a, 1d.
III-4. Briefing, subj: Mission of DAC-F, 1998.
III-5. MG Leo J. Baxter, "Meeting the Future: State of the Field Artillery," Field Artillery, Nov-Dec 98, p. 1.
III-6. BG Toney Stricklin, "Fires: The Cutting Edge for the 21st Century," Field Artillery, May-Jun 98, p. 22.
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III-8. Briefing, subj: CINCOS, 10 Sep 98.
III-9. Msg, subj: CINCOS GOSC Results, 26 Aug 98.
III-10. Msg with Atch, subj: TRADOC CINCO Proposals, 15 Jul 98.
III-11. Msg, subj: FY98 Programmed Managed Losses and Change in NCO Structure, 101707Z Jun 98.
III-12. Information Paper, subj: CINCOS, undated.
III-13. Fact Sheet, subj: CINCOS, Feb 98.
III-14. Msg, subj: CINCOS Reductions by MOS and Grade, 17 Aug 98.
III-15. Memorandum for Directors of Resource Management and Manpower Officers, subj: NCO Grade Reductions/CINCOS, undated.
III-16. Msg with Atch, subj: CINCOS Reductions by MOS and Grade, 17 Aug 98.
III-17. Memorandum for Chief of Staff Training Command with Encls, subj: CINCOS, 10 Aug 98.
III-18. Memorandum for CG, subj: CINCOS NCO Grade Reductions--Decision Paper, 2 Sep 98.
III-19. Msg with Atch, subj: Message for the SMA, CINCOS, 19 Aug 98.
III-20. Briefing, subj: TRADOC TDA NCO Reduction, undated.
III-21. Briefing, subj; To Obtain CG Approval on 120 NCO Reductions, undated.
III-22. Msg, subj: CINCOS GOSC Results, 26 Aug 98.
III-23. Memorandum for Cdr, TRADOC, subj: CINCOS Re-grading of TDAs, 27 May 98.
III-24. Msg, subj: CINCOS CMF Spread, 17 Aug 98.
III-25. Msg, subj: CINCOS NCO Grade Reductions, 16 Aug 98.
III-26. Memorandum for PMO, USAFAS, subj: TRADOC Response to Change in NCO Structure, 10 Jul 98.
III-27. Memorandum for DRM, subj: CINCOS Increased NCO Reduction Impact Statement, 17 Aug 97.
III-27A. Draft Memorandum for Cdr, TRADOC, subj: Fort Sill CINCOS Reduction by MOS and Grade, 18 Aug 98.
III-28. Msg, subj: CINCOS, 19 Aug 98.
III-29. Msg, subj: none, 21 Aug 98.
III-30. Msg, subj: CINCOS, 31 Aug 98.
III-31. Memorandum for Cdr, TRADOC, subj: Fort Sill CINCOS Reductions by MOS and Grade, 8 Sep 98.
III-32. Msg, subj: Revised CINCOS Adjustment Guidance, 21 Aug 98.
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III-37. Briefing, subj: OPMS XXI Recoding, 1997.

III-38. Memorandum for Record, subj: Notes from the OPMS XXI Officer Development Update, 19 Nov 98.

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INDEX

A

U

V

W

DIVISION ARTILLERY STAFF TRAINER

In 1996 the Unit Training Division, Warfighting Integration and Development Directorate (WIDD), U.S. Army Field Artillery School (USAFAS) pointed out that the future battlefield would be different from current battlefields. Modern weaponry, brilliant munitions, and the high cost of fielding large armies would create widely dispersed battlefields. Operations would be more fast paced and more lethal than in the 1990s, while vast amounts of information produced by advanced technology, especially digitization, would be generated from many sources. In view of this, the Commandant of the Field Artillery School, Major General Randall L. Rigby, said, "Digitization of the force will require us to rethink the way we train the FA soldier and his commanders and staffs -- our frame of reference will have to shift."[258]

To meet the challenges the methods of training division artillery staffs had to change. Upon becoming the Assistant Commandant of the Field Artillery School, Brigadier General William J. Lennox, Jr., launched an initiative to improve such training. Because the division artillery staff had to interact with the division staff and subordinate field artillery units, training was difficult. Traditionally, training took place in division training exercises where the entire division staff and division artillery staff could respond to different tactical scenarios, share information, and pass orders. Although this method proved to be expensive, the lack of training time and personnel tempo provided the rationale for failing to conduct planned division command post exercises. General Lennox saw advanced technology in the form of simulations as a solution.[259]

In view of this, the Unit Training Division started a study in 1996 to determine the requirements for an automated division staff

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[258]1996 USAFACFS ACH, pp. 67-68.

[259]Ibid., p. 68; 1997 USAFACFS ACH, pp. 39-40.

trainer that would use simulations to exercise the division artillery staff and the fire support elements from the division's main and tactical command post in key staff functions. During the year, the division worked to define staff training requirements and current training deficiencies and to determine the feasibility of training a division artillery staff in three training environments -- live, virtual, and constructive.[260]

[260]1996 USAFACFS ACH, pp. 68-69; 1997 USAFACFS ACH, p. 40.

Based upon that study that was completed early in 1997, a team headed by the Depth and Simultaneous Attack Battle Laboratory in the Field Artillery School conducted a concept experimentation program called the Division Artillery Staff Training Driver. As planned, the program would test the integration of automation, simulation, and digital operations for training division artillery staffs. Using a mission scenario and time-ordered events list, the experimentation team would transmit fire missions, message traffic, and unit movement data from the Digital Systems Test and Training Simulator (DSTATS) or the Fire Support Automated Test System (FSATS) to division artillery tactical operations center's (TOC) command and control systems during a command post exercise (CPX). Specifically, the DSTATS would stimulate the Initial Fire Support Automated System (IFSAS), and the FSATS would activate the Advanced Field Artillery Data System (AFATDS). To further replicate tactical scenarios the experimentation team would even send voice communications to the division artillery tactical operations center and the division's fire support elements. Staff performance would then be measured against expected standards developed for each event.[261]

Employing the results of the tests of the drivers of October 1997 and January 1998, the Field Artillery School intended to develop requirements for an exportable, easy-to-use, digital trainer driver for field artillery units. The system would allow a field artillery staff to conduct realistic, high fidelity sustainment training using their own command and control equipment without any additional outside resources.[262]

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[261]1997 USAFACFS ACH, p. 40.

[262]1997 USAFACFS ACH, p. 41.